COURSE DATA

DATA SUBJECT

Code: 36849
Name: Endocrinology and Reproduction
Cycle: Undergraduate Studies
ECTS Credits: 4.5
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1106 - Degree in Biology	Facultat de Ciències Biològiques	4	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1106 - Degree in Biology	Optatividad	ELECTIVES

COORDINATION

SILVESTRE CAMPS MIGUEL ANGEL

SUMMARY

Endocrinology and Reproduction is a matter that deals with the hormonal mechanisms regulating homeostasis, development, growth and reproduction, whilst also studying the reproductive process. It also examines abnormalities in these processes and mechanisms, as well as the therapeutic and technological strategies for addressing them. This is an optional matter taught in the first term of the fourth year.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

COMPETENCES / LEARNING OUTCOMES

1106 - Degree in Biology

(CB3) Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.

(CB4) Students must be able to communicate information, ideas, problems and solutions to both expert and lay audiences.

(CB5) Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.

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

Develop the skills needed to carry out a professional activity with a proactive attitude towards the world of work and with an innovative and entrepreneurial spirit. Be able to apply sustainability criteria and to work within the framework of professional ethics.

Interpret, analyse, evaluate, process and synthesise biological data and information by applying mathematical and statistical methods.

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.

Understanding the biological basis of the endocrine system during different stages of life and its dysfunctions. Understanding the mechanisms of fertilization, its possible alterations, and the fundamentals of human and animal reproductive technology.

Use ICTs, apps and other computer tools to manage and disseminate information in both educational and professional environments.

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

BLOCK 1. ADVANCED PRINCIPLES OF COMPARATIVE ENDOCRINOLOGY

Topic 1. The concept of the endocrine system in animals. Molecular diversity of hormonal signaling. Hormone receptors and transduction mechanisms.

Topic 2. Organization of endocrine networks

Topic 3. Biological rhythms and endocrine chronobiology

Topic 4. Endocrinology of stress in different animal groups

Topic 5. Endocrine disruptors and environmental disturbances. Endocrine integration and physiological adaptation.

BLOCK 2. ENDOCRINOLOGY OF DEVELOPMENT AND GROWTH

Topic 6. Endocrine programs of development. Metamorphosis in insects. Molting and growth in crustaceans. Endocrinology of growth.

Topic 7. Developmental plasticity and environmental programming.

BLOCK 3. REPRODUCTIVE FUNCTION.

Topic 8: Sexual differentiation and development, and gametogenesis.

Topic 9. Ovarian and testicular function. Anatomy of the reproductive organs. Regulation of ovarian and testicular function.

Topic 10. Mechanisms of sexual response. Reproductive behavior. Modification of the estrous cycle. Semen collection and evaluation. Assessment of sperm parameters.

Topic 11. Gamete and embryo transport. Fertilization. Embryonic development.

Topic 12. Implantation, gestation, parturition, and lactation. Types of implantation and placentas. Aging and reproduction.

BLOCK 4. CONTRACEPTIVE METHODS, INFERTILITY, ASSISTED REPRODUCTION

Topic 13. Assisted reproduction techniques. Artificial insemination. In vivo and in vitro embryo production. Embryo manipulation. Embryo transfer. Gamete and embryo preservation.

Topic 14. Male and female contraceptive methods. Mechanisms of action and effects.

Topic 15. Male and female infertility. Epidemiology of infertility. Causes of male and female infertility.

BLOCK 5. PRACTICAL KNOWLEDGE

1. Endocrine control of sexual and parental behavior. Determination of hormone levels using ELISA.

2. The neuroendocrine system in animal models of genetic diseases.

3. Assisted reproductive techniques: Oocyte retrieval and cryopreservation.

4. Sperm retrieval from the epididymis and in vitro evaluation.

5. Assisted reproductive technologies: in vitro evaluation and IVF.

BLOCK 6. SEMINARS AND TUTORIALS

These are activities in which students will be required to reflect on, interpret, and discuss various aspects or topics of interest related to the course.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	1,00
Theory	29,00
Laboratory	15,00
Total hours	**45,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	67,50
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**67,50**

TEACHING METHODOLOGY

The methodology for the various proposed activities (in-person and online) is described below:

- **Theoretical lectures**, which will be delivered sequentially throughout the first semester so that they are integrated with the rest of the proposed activities.

- **Practical laboratory classes**. These classes will take an applied approach to the content on endocrinology and reproduction, promoting understanding through experimentation and hands-on work in the laboratory. In each session, students, working in pairs, will carry out the proposed activities after reading the

instructions previously provided through the Virtual Classroom. In addition, students will acquire the skills and abilities necessary for effective laboratory work.

- **Seminars and tutorials**. Both activities will be conducted using a problem- and case-based learning methodology, designed to promote the integrated application of knowledge, critical thinking, analytical skills, and problem-solving abilities, as well as the acquisition and consolidation of subject-specific competencies. These are one-hour sessions in which students, working in groups, will solve problems or discuss topics or issues related to the course based on previously assigned materials (articles, reports, lab experiments, project worksheets, etc.).

Summary of Teaching Methodologies:

- Lectures and practical classes.

- Participatory and/or discussion-based classes.

- Reading and discussion of texts.

- Learning based on solving exercises and problems.

- Analysis and case studies.

IMPORTANT NOTE: The Virtual Classroom is considered the official bulletin board and the standard channel for communication between faculty and students. Exam schedules, notices regarding changes to the planned calendar, grade notifications, and exam review schedules will be posted on this platform, and it is the students' responsibility to stay informed of these communications, as well as to ensure that the email account provided by the University is set up properly to receive messages. Furthermore, students are asked to use their official UV email account—and no other—in their email communications with faculty. Messages from other sources will be ignored.

EVALUATION

Assessments consisting of written, oral, and/or practical exams (95%):

Theoretical knowledge (65%):

An exam will be administered at the end of the semester, consisting of various multiple-choice, short-answer, and medium-length answer questions on basic concepts and processes in endocrinology and reproduction. The grade obtained on the theoretical knowledge assessment accounts for 65% of the final grade for the course.

Practical knowledge (30%):

An exam on the knowledge acquired during the laboratory practicals will be administered, along with the theory exam, at the end of the semester. This exam may include short-answer questions, problem-solving tasks, or experimental aspects related to the practicals performed. The grade obtained will account for 30% of the final grade for the course.

Assessment of seminars, problem-solving sessions, and group tutorials: attitude, skills, reports, project reports, and oral communication (5%):

For the assessment of seminars and tutorials, the participating students' ability to synthesize and integrate knowledge will be taken into account, as well as the clarity and quality of their discussion of the content and their participation in the final session. The grade earned will account for 5% of the final grade for the course.

In order to pass the course during the first exam session, students must pass both the theory and the practical components independently with a minimum grade of 5 or higher, and thus achieve an overall grade of 5 or higher out of 10. If you do not pass the course during the first exam session (January), the grades from the theory and practical exams, as well as the seminars and tutorials, will be carried over to the second exam session.

The second exam session will consist of a single exam similar to the first, and the same requirements apply for passing.

IMPORTANT NOTE: To be admitted to any exam, students must provide proper identification. The use of cell phones, MP3 players, or similar devices is not permitted during exams.

REFERENCES

- Atención Integral de la Infertilidad: Endocrinología, Cirugía y Reproducción Asistida (4ª Edición). 2020. Pérez Peña E. Editorial Médica Panamericana.
- Manual práctico de esterilidad y reproducción humana (5ª edición). 2017. Remohí et al. Editorial Médica Panamericana.
- Encyclopedia of Reproduction, 2nd edition, Volumes 1 and 2. Academic Press, 2018 Michael K. Skinner. https://doi.org/10.1016/B978-0-12-811899-3.64553-6
- Biotecnología de la reproducción aplicada a especies de interés veterinario. 2017. Arias-Álvarez et al. INIA.
- Endocrine disruptors in the environment. Khetan, S.K. (2014). John Wiley & Sons, Inc. New

Jersey. USA

- Vertebrate Endocrinology (6ª ed.). Norris, D.O. & Carr, J.A. (2020) Academic Press / Elsevier. ISBN: 978-0-12-820093-3

- Comparative Endocrinology of Animals. Narayan, E. (Ed.). (2019). IntechOpen. https://doi.org/10.5772/intechopen.73427

- Environmental endocrinology and endocrine disruptors: endocrine and endocrine-targeted actions and related human diseases. (1st ed). Pivonello, R. & Diamanti-Kandarakis, E. (Eds) (2023). Endocrinology.Series. Springer Nature, Switzerland.

- General and Comparative Endocrinology: An Integrative Approach (1st ed.). Schreiber, A.M. (2023). CRC Press. https://doi.org/10.1201/9781003359241