



Universitat de Lleida

DEGREE CURRICULUM  
**ANIMAL REPRODUCTION**

Coordination: GARCIA ISPIERTO, IRINA

Academic year 2022-23

## Subject's general information

<b>Subject name</b>	ANIMAL REPRODUCTION			
<b>Code</b>	100313			
<b>Semester</b>	2nd Q(SEMESTER) CONTINUED EVALUATION			
<b>Typology</b>	<b>Degree</b>	<b>Course</b>	<b>Character</b>	<b>Modality</b>
	Double bachelor's degree: Bachelor's Degree in Veterinary Medicine and Bachelor's Degree in Science and Production	2	COMPULSORY	Attendance- based
<b>Course number of credits (ECTS)</b>	6			
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	<b>PRACLIN</b>	<b>PRAULA</b>	<b>TEORIA</b>
	<b>Number of credits</b>	0.3	1.1    0.6	4
	<b>Number of groups</b>	8	2    3	1
<b>Coordination</b>	GARCIA ISPIERTO, IRINA			
<b>Department</b>	ANIMAL SCIENCE			
<b>Teaching load distribution between lectures and independent student work</b>	Horas presenciales: 60 Horas no presenciales: 90			
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.			
<b>Language</b>	Catalán: 60% Castellano: 30% Inglés: 10%			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
GARCIA ISPIERTO, IRINA	irina.garcia@udl.cat	6,5	
GRACIA GIL, ALBA MARIA	alba.gracia@udl.cat	1,5	
PALACÍN CHAURI, ROGER JOAN	roger.palacin@udl.cat	1,5	
ROJAS CAÑADAS, EBER	eber.rojas@udl.cat	,9	

## Learning objectives

Objectives of knowledge: The student that exceeds the subject must: Know the basics of Reproduction Biology of domestic mammals, as well as the bases of artificial regulation of the reproductive process. Special emphasis will be given to the various technologies derived from the Artificial Insemination and Transfer of Embryos.  
Pathology of reproduction

Capacity objectives:

The student that exceeds the subject must be able to: To use the previously indicated knowledge in the regulation of the reproductive process and to be able to analyze the economic implications of the control of reproductive parameters at the level of exploitation for the different domestic species. Special emphasis will be given to the use of ultrasound as a basic tool for reproductive control.

Recognize the involvement of gender in those aspects of the discipline that affect men and women differently, both in biological, social and cultural aspects. Recognizes, categorizes, and ethically reflects the importance of the gender category for the geosciences applied to social, political, and economic processes.

## Competences

Transversal competences of the degree 1. Interpret studies, reports, data and analyze them numerically. 2. Work alone and in a multidisciplinary team. 3. Understand and express with the appropriate terminology. 4. Discuss and argue in various debates. 5. Analyze and evaluate the social and ethical implications of the professional activity. 6. Have a critical and innovative spirit.

Veterinary specific competences 1. Know the basics of animal reproduction and have the capacity for practical application in the management of animals. 2. Know the process of reproduction of farm animals, as well as the technologies for their manipulation and control. 3. Know the main reproductive pathologies and their treatments

Other competences 1. Reproduction, delivery and puerperium: cures and diseases 2. Assisted reproduction

Vet+CPA competences

Basic skills: • CB1 Possess and understand knowledge in an area of study that begins at the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of your field of study • CB2 Apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study. • CB3 Ability to collect and interpret relevant data (usually within their study area) to make judgments that include reflection on relevant issues of a social, scientific or ethical nature • CB4 Being able to transmit information, ideas, problems and solutions to a specialized and non-specialized audience) • CB5 Know how to develop those learning skills necessary to undertake further studies with a high degree of autonomy

Transversal Competences • CT1 Acquire an adequate understanding and oral and written expression of Catalan and Spanish • CT2 Acquire significant command of a foreign language, especially English • CT3 Acquire training in the use of new technologies and information and communication technologies • CT4 Acquire basic knowledge of entrepreneurship and professional environments • CT5 Acquire essential notions of scientific thought CT6 Apply the gender perspective to the tasks of the professional field to the list of competences of the degree and will be deployed in the subject

General Competences: • CG3 Control of the breeding, management, welfare, reproduction, protection, and feeding of animals, as well as the improvement of their productions • CG5 Knowledge and application of legal, regulatory and administrative provisions in all areas of the veterinary profession and public health, understanding the ethical implications of health in a changing global context. • CG6 Development of professional practice with respect to other health professionals, acquiring skills related to teamwork, efficient use of resources and quality management

Clinical science and health skills CE19 Know the principles of reproduction, childbirth, puerperium and assisted reproduction: care and diseases

## Subject contents

Topic 1. Conceptual, epistemological and historical aspects related to the Science of Animal Reproduction. Definition of bioindustrial ecosystem. Man and animal domestication. Historical development of Zootechnics and understanding of the reproductive process. The Technology of Reproduction today.

Topic 2. Endocrinology of reproduction. The hypothalamo-adenohypophysial-gonadal axis. The pineal gland Follicular dynamics and gonadotropic retrocontrol. Gonadotropins and sex steroid hormones. The prostaglandin F<sub>2α</sub>, inhibin, prolactin and relaxin.

Topic 3. Cyclicity in the female. Follicular and luteal phases of the female genital organs. Seasonal reproduction and photoperiodism. Reproductive behavior

Unit 4. Immuno-endocrine modulation of pregnancy. Immuno-endocrine mechanisms related to the gestational period. Importance of placental progesterone.

Topic 5. Labor. Preparatory signs of childbirth. The eutocic birth. Birth phases. Dystocic labor. Endocrine sequences of the end of gestation and delivery. Rhythms circadians of childbirth.

Topic 6. The puerperium. Newborn care. Start of lactation. Effects of breastfeeding.

Topic 7. Reinstatement of cycles strictly after delivery. Anestrus. Postpartum endocrinology. Uterine involution First ovulation and return to the cyclicity. Principal pathologies in different species

Topic 8. The male. Exploration of the males. Impotencia coeundi and generandi. Principal pathologies of male.

Topic 9. Development of artificial insemination. Cryobiology and conservation of semen. Factors that affect the seminal quality and fertility of the bull. Laboratory tests of seminal quality. Sexatge of semen. Insemination procedures. Optimum timing of insemination. Multiple inseminations. Place of deposition of semen. Intraperitoneal insemination. Learning the technique of insemination. The inseminator and the confirmation of estrus.

Topic 10. Future of insemination technology. Ovine and caprine. Porcine. Equine. Rabbits Dog and cat. Expectations of artificial insemination technology.

Topic 11. Regulation of ovarian function. The detection of estrus. Synchronization protocols of oestrus and ovulation: in cyclic females, in the anestrus of lactation / seasonal anestrus. Control of multiple ovulations in monotocas.

Topic 12. Technology of the diagnosis of pregnancy. Control of return to estrus. Physical methods Hormonal methods Ultrasound Determination of the fetus number. Determination of sex

Topic 13. Live embryo production. Induction to superovulation. Embryo collection and evaluation. In vitro culture and cryopreservation of embryos.

Topic 14. Embryonic transfer. Selection and management of the receivers. Synchrony between the donor and recipients. Procedures of non-surgical transfer of embryos. Bisection and sexatge of the embryos.

Topic 15. Production of in vitro embryos. Collection techniques of oocytes. The insemination in in vitro fertilization. Intra-cytoplasmic insemination. In vitro fertilization. In vitro culture of the embryos. Cloning technologies. Production of transgenic animals. Consequences of the use of different technologies.

Item 16. Control of labor, postpartum and the onset of puberty. Interruption of pregnancy, indications. Hormone induction of labor. Induction of the resumption of ovarian activity. Practical implications of precocious puberty. Hormonal induction of puberty. Artificial lactation

Topic 17. Cesarean section

## Practical activities

Practice 1. Exploration of the female genital tract to the dissection room. Vaginal cytology.

Practice 2. Video projections. Video projections followed by a seminar related

Practice 3. Fundamentals of ultrasound. Ultrasound, a revolutionary tool at the farm level and in research

Practice 4. Evaluation of semen and preparation of seminal doses.

Practice 5. Artificial insemination in cow and sow. The cow and the sow as study models for artificial insemination.

Practice 6. Ultrasound applied to Animal Reproduction. Ultrasonic morphology of ovarian structures, uterus not gestating, position-part and cyclic. Ultrasonic anatomy of the pregnant uterus and concepts. Applied aspects of the detection of gestation by ultrasound. Determination of sex.

Practice 7. Embryonic micromanipulation. Identification of the different stages of the preimplantation embryo. Morphological evaluation of embryos. Embryonic manipulation.

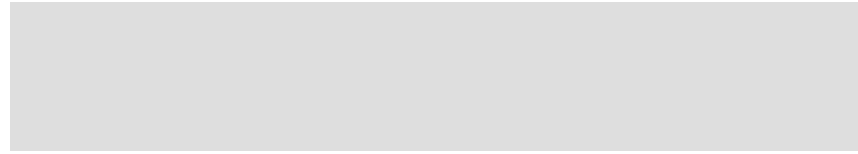
Practice 8. Exploration of male genital tract

## Methodology

The subject will be developed in weekly sessions of 4 hours. The active learning of the student is encouraged, so the master class is reduced to the minimum. The student becomes responsible for their learning, conducting personal study, work, group classes, posters and activities that encourage the individual growth of knowledge. The

subject requires reading scientific publications in English from the main scientific databases, as well as active involvement of students. There is also a visit to dairy farm to implement the skills acquired during the course

## Development plan



## Evaluation

Cumulative test type tests: 12, 18 and 26%

Socratic, flipped learning, and practices: 10%

poster: 10%

video: 10%

Final cooperative learning: 12%

## Bibliography

### Basic

Arthur GH., Noakes DE., Pearson H., Parkinson TJ. Veterinary reproduction and obstetrics. Saunders Co. Ltd. 7th edition.

Gordon I. Tecnología de la reproducción de los animales de granja. Acribia, 2006. Fields MJ, Sand RS, Yelich JV. Factors affecting calf crop. Biotechnology of Reproduction. CRC Press, 2002.

Senger PL. Pathways to Pregnancy and Parturition. Current Conceptions, Inc., 2006.

### Complementary

REPROLOGY. Controlar la reproducción es controlar el futuro, CEVA Santé Animale, 2001 (CD-ROM)

REPROLOGY. Ecografía del aparato genital de los rumiantes, CEVA Santé Animale, 2007 (CD-ROM)