General information	
Academic subject	**FUNDAMENTALS OF REPRODUCTION IN DOMESTIC ANIMALS**
Degree course	Animal Science
Academic Year	2022/2023 – III year
European Credit Transfer and Accumulation System (ECTS)	5 +1
Language	Italian
Academic calendar (starting and ending date)	I semester
Attendance	Compulsory

Professor/ Lecturer	
Name and Surname	Luisa Valentini; Davide Monaco
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Department and address	Campus of Veterinary Medicine, S.P. 62 to Casamassima km 3, 70010 Valenzano (Ba)
Virtual headquarters	Microsoft teams: code sqn2guz and code g8618vm
Tutoring (time and day)	Valentini: By appointment via e-mail. Tuesday: 03:00 – 04:00 p.m.; Thursday: 12:30 – 01:30 p.m.; Friday: 12:30 – 01:30 p.m. Monaco: By appointment via mail. Tuesday, Wednesday and Thursday 15.30-16-30 In Department or via Microsoft Teams platform

Syllabus	
Learning Objectives	The course provides fundamentals about animal reproduction and particularly: female and male reproductive behaviour and physiology in canine, feline and in livestock species (equine, bovine, sheep, goat, swine, other); reproductive biotechnologies, benefit and weaknesses related with species and production systems; criteria for reproductive conditioning; assisted reproductive technologies and their application in different species and breeds, particularly in livestock species. The course also provides knowledge and practical skills for working in livestock semen production centres and for reproduction management in pets and livestock species.
Course prerequisites	To take the exam, the student must have passed the 1st year exam of 'Physiology and endocrinology of domestic animals: basic knowledge'.
Contents	General Part Gametogenesis and gonadal activity: ovarian cycle, folliculogenesis and oogenesis; spermatogenesis and spermiation, sperm maturation and capacitation; cycle of the seminiferous epithelium. Secondary sex characteristics. Macroscopic, microscopic, and computerized analysis of semen quality (concentration, viability, motility, morphology, capacitation and acrosome reaction). Notes on hormones and drugs that affect reproductive cycle. Endocrine disruptors and their impact on the reproductive system. Companion animals (dog; cat) Ovarian cycle. Female evaluation criteria in anticipation of reproduction. Detection and monitoring of ovulation to determine fertile period. Pregnancy. Delivery. Puerperium. Breeding of litter and neonatal period. Anatomical features of the male genital system; characteristics of the ejaculate. Evaluation criteria of the breeding male. Male reproductive behaviour. Notes on assisted fertilization techniques. Livestock

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	Recall about anatomy of the male and female genital system and specie-specific features characterizing the collection of semen and the specific techniques for artificial insemination in livestock species (horses, cattle, buffaloes, sheep and goats, pigs, donkeys). Reproductive physiology (oestrus cycles, detection of oestrus, evaluation of reproductive behaviour, pregnancy, birth monitoring, post-partum pathologies). Evaluation of bovine farm fertility index (and hypofertility). Notes on national regulations on animal reproduction (artificial insemination, semen production and semen delivery centres). Techniques of semen collection, analysis, manipulation, conservation and management and hints on artificial insemination techniques in large animal species. Notes on the conditioning of reproductive activity (seasonal adjustment and heat synchronization).
Books and bibliography	1) Hafez B, Hafez ESE (2011), 'Riproduzione negli Animali d'Allevamento'. Ed. Libreriauniversitaria.it. 2) Pinkert CA (2002) Assisted Reproductive Technologies and Embryo Culture Methods for Farm Animals. In Transgenic Animal technology. A laboratory handbook. Academic Press, London UK. 513-568. 3) Veronesi MC, Castagnetti C, Taverne MAM, Neonatologia Veterinaria. EdiSES. 4) Senger (2012): Pathways to Pregnancy and Parturition, 3rd Edition 5) Youngquist RS, Threlfall WR (2007): Current Therapy in Large Animal Theriogenology, 2nd edition 6) Noakes D, Parkinson TJ, England GCW (2019). Veterinary reproduction and Obstetrics, 10th edition 7) Piu M (2015) Manuale di Apicoltura: Regione Sardegna Servizio sviluppo delle Filiere Animali. Pdf 8) Presentazioni PowerPoint, articoli da testi e riviste scientifiche consigliati e/o forniti dal docente.
Additional materials	Lecture notes are recommended. To improve learning, additional material will be provided (links to websites, video tutorials or specific links related to the topics covered).

Work schedule	

Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
125	50	25	75
CFU/ETCS			
6	5	1	
Teaching strategy	Knowledge acquisition will be based mainly take place on lectures. The lessons will take place in the classroom, equipped with a personal computer connected to a projector, mainly using the PowerPoint software to support the explanation with slides and videos. In the event of restrictions related to the Sars-Cov2 pandemic, the blended learning mode will also be activated using the Microsoft Team platform. Specific seminars will be organized by lecturer Applied knowledge will be provided through practical laboratory exercises and field visits to livestock farms.		
Expected learning outcomes			
Knowledge and understanding on:	o Reproductive management of companion and farm animal species.		

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Applying knowledge and understanding on:	o reproductive physiology of companion and farm animal species and ability to manage/monitor different reproductive processes (fertilization, pregnancy and rearing of the offspring); o detect reproductive problems/pathologies due to incorrect management or other causes; o assisted reproductive technologies and their applications; o collect and critically evaluate farm fertility index or individual animal reproductive processes, identify critical issues and intervention margins, formulating solution/treatment management options/plans in collaboration with other professional figures (veterinarians, specialized technicians); o evaluation, management and improvement of farm animals reproductive processes; o collection, evaluation, preparation (dilution, freezing, storage, thawing) and handling of semen in different livestock species.

Soft skills	● *Making informed judgments and choices*
	   o collect and interpret data about reproductive activity of individual companion animal, dog/cat breeding kennel or livestock farms
	   o formulate a hypothesis and option of intervention for problem solving/improvement of reproductive processes
	   o manage reproduction in the livestock and companion species, identify any critical issues and propose intervention criteria
	   o implement breeding programs (farms and companion animals breeding Kennel)
	 ● *Communicating knowledge and understanding*
	   o Mastery of the course/reproductive terminology; efficiently communicate and explain reproductive processes/issues/management/treatment options with owners/staff members or other interlocutors.
	 ● *Capacities to continue learning*
	   o Acquisition of basic principles and of an overview about animal reproductive physiology and assisted reproductive technologies; this background will allow him/her to independently progress and deep knowledge through voluntary studies and by planning and attendance to post-graduate theoretical-practical training courses. Reference texts and bibliographic material will be provided for promoting and enhancing voluntary study.

Assessment and feedback	
Methods of assessment	Learning achievements will be assessed through an oral interview. Written interim tests may be scheduled, lasting two hours, with multiple and open answers. The final score will be composed of the weighted average of the marks obtained during the written and oral tests. As minimum requirements the student shall: - demonstrate knowledge acquisition about fundamentals of reproductive processes; - acceptably reply to at least two interview questions/subjects.

Evaluation criteria	● *Knowledge and understanding*
	   o Demonstration of a deep understanding of the requested subject/topic by providing targeted and well-organized answer.
	 ● *Applying knowledge and understanding*
	   o Understand, evaluate and provide operational strategies for optimizing livestock and companion animals reproductive management and solve problems related to uncorrected reproductive management.
	 ● *Autonomy of judgment*

	o Demonstration of critical thinking and critical evaluation of farm/animal reproductive index/parameters. • *Communicating knowledge and understanding* o The student has to demonstrate a clear, linear and not desultory knowledge of the topics as well as an accurate language and proper use of technical vocabulary. ● *Communication skills* o Demonstrate communication skills and mastering of the specific subject lexicon. ● *Capacities to continue learning* o Provide correct answer during oral evaluation.
Criteria for assessment and attribution of the final mark	The final score mark is expressed in scores out of thirty; the minimum mark for passing the exam is 18/30. Assessment criteria would consider: the student's ability to express himself clearly, comprehensively and with appropriate terminology. Demonstration of knowledge acquisition, deep understanding and proper exposition of course contents. Honours (30 *cum laude*) will be considered only if the student will exhaustively answer to all questions with excellent exposition and proper lexicon.
Additional information	

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