

**SYLLABUS – PULS Doctoral School**

Name of the course (as specified in the approved program): <b>Animal production, part 2</b>	
Name of the course in Polish: <b>Produkcja zwierzęca, część 2</b>	
Unit providing the course (Department): <b>Department of Genetics and Animal Breeding</b>	
Course leader: <b>Prof. dr hab. Dorota Cieślak</b>	
Discipline: <b>Animal science and fisheries</b>	Semester: <b>3</b>
<b>TYPE OF CLASSES:</b> (course load)	
- Lectures	<b>5</b>
- Practical classes	<b>7</b>
- Self-study	<b>10</b>
Total number of hours:	
<b>22</b>	
<b>OBJECTIVE OF THE COURSE:</b>	
Present the current state of knowledge on procedures in assisted reproduction (ART) and genomic selection. Familiarization with the practical implementation of procedures in cattle breeding.	
<b>TEACHING METHODS:</b>	
Multimedia presentations Journal club – selecting data for discussion Analysis of case studies Computer lab	
<b>EDUCATION OUTCOMES</b>	Reference to education outcomes of the PULS Doctoral School
In the area of knowledge (PhD students know and understand): 1. The global scientific literature on ART technologies, breeding programs, and genomic selection, along with their implications for animal production. 2. The latest theories and trends in these three areas of animal production supporting the development of original research concepts and scientific interpretations.	(P8U_W_1) (P8U_W_2)
In the area of skills (PhD students know how to): 3. Utilize acquired knowledge to formulate research problems. 4. Solve research problems using acquired knowledge of state-of-the-art methods and research tools.	(P8U_U_1) (P8U_U_2)
In the area of social competencies (PhD students are capable to): 5. Independently plan research and contribute to the dissemination of the existing body of scientific literature. 6. Maintain and promote the importance and role of the intellectual community in social life.	(P8U_K_1) (P8U_K_5)
<b>Methods of evaluation of outcomes achievement:</b> Discussion (theoretical knowledge): learning outcomes 1, 2, and 5 Exercise report (practical knowledge): learning outcomes 3, 4, 5, and 6	
<b>TEACHING CONTENT:</b>	
<ul style="list-style-type: none"> <li>• Assisted Reproductive Techniques (ERPs) in Animal Breeding (ERPs): protocols, efficiency, scope of application in dairy and beef cattle, advantages compared to standard reproductive programs, and the role of preimplantation embryos in genomic selection.</li> <li>• Practical exercises: 1) reproductive biotechnology laboratory (collection and evaluation of gametes: oocytes and sperm), 2) computer laboratory - genomic data analysis (genomic relationships, genome-wide association study (GWAS))</li> <li>• Breeding Programs: key concepts in animal breeding and their implementation in breeding practices.</li> </ul>	

- Genomic Selection in Cattle Breeding: key elements of the procedure and its application in breeding programs

<p><b>The course completion criteria and methods:</b>                  Form: Assessment Lecture:                  • Participation in discussion                  Exercises:                  • Written transcript from practical sessions</p> <p>Criteria                  • Attendance at least 80%                  • Active participation in class (participation in discussion, answering lecturer's questions)</p> <p><input checked="" type="checkbox"/> <b>pass (Z)</b>                      <input type="checkbox"/> <b>course credit with a grade</b>                      <input type="checkbox"/> <b>examination</b></p>	<p>Percent of a final grade:                  40%                  60%</p>
<p style="text-align: center;"><b>RECOMMENDED LITERATURE:</b></p> <ol style="list-style-type: none"> <li>1. Bouquet J, Juga J (2013) Integrating genomic selection into dairy cattle breeding programs: a review. <i>Animal</i> 7(5):705-13</li> <li>2. Hasler JF (2014) Forty years of embryo transfer in cattle: a review focusing on the journal <i>Theriogenology</i>, the growth of the industry in North America, and personal reminiscences. <i>Theriogenology</i> 81(1):152-169</li> <li>3. Lopez LR (2020) Ovum pick-up (OPU) in cattle – an update. In: Gardon JC (ed) <i>Biotechnologies Applied to Animal Reproduction. Current trends and practical applications for reproductive management</i>. Apple Academic Press ISBN 9781774639016</li> <li>4. Oliveira CS et al (2023) Embryo biopsies for genomic selection in tropical dairy cattle. <i>Animal Reproduction</i> 20(2):e20230064</li> </ol>	