### Module title
Andrology and artificial insemination

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<tr>
<th>Polish Translation</th>
<th>Andrologia i sztuczne unasiennianie</th>
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### Catalogue number
ECTS 3

### Group of subjects
basic / professional

### Faculty
Faculty of Veterinary Medicine

### Person in charge of the module
dr Ricardo Faundez

### Teachers responsible for laboratory classes, workshops and seminars
Staff and PhD students of the Department of Large Animal Diseases with Clinic

### Unit responsible for the module
Department of Large Animal Diseases with Clinic

### Faculty in charge
Faculty of Veterinary Medicine

### Module status
a) mandatory / elective  
b) stage JM year 4  
c) intramural

### Teaching cycle
Semester: winter / summer  
Module language: English

### Objectives of the module
The aim of the course is to acquaint students with the basics of andrology and artificial insemination of animals. The program includes subjects on veterinary clinical andrology for the treatment of infertility and male diseases. Furthermore includes basics knowledge on different techniques of reproductive biotechnology, as artificial insemination, embryo transfer, assisted reproduction techniques. Students will receive the recent knowledge concerning the functional anatomy of the male reproductive system, endocrine control of testicular function, spermatogenesis, and its control, male sexual behaviour, semen analysis, semen preservation, male sexual function pathology, pharmacological control of sexual function of male and female. They also learn about the physiology of female sexual cycle, oestrus synchronization, superovulation, embryo transfer and assisted reproductive techniques.

### Teaching forms and number of hours
a) Lectures: 14 h  
b) Practicals: 20 h  
c) Field exercises: 6 h

### Teaching methods
Presentations with demonstrations and discussion on the presented material, experiments.

### Detailed module description
The course is divided in 2 principal parts. First deals with basic and clinical topics of development, anatomy, reproductive physiology and endocrinology of male reproductive system. Furthermore the physiopathology of the male reproductive system and the sexual behaviour and its disorders are thoroughly presented. This includes clinical evaluation of the reproductive organs An important subject deals with fertility and infertility in males, the assessment of male reproductive potential and fundamentals on artificial insemination. In this part students perform practical activity in slaughterhouse in which they train technique of Al in cows. Different techniques of cryopreservation of semen are also presented.

The second part of the course deals with other procedures besides artificial insemination named biotechnological techniques in animal reproduction. This part includes subjects as: In vitro embryo production (IVP), control of folliculogenesis, the preparation of donors and receivers for embryo transfer, techniques for collection of the embryos and their quality assessment for the transfer. The course includes also subjects dealing with advanced techniques of assisted reproduction as micromanipulation of gametes and embryos. Intracytoplasmic sperm injection to the cytoplasm (ICSI), assisted zona hatching (AZH), biopsy blastomeres for PGD/PGS. Finally a survey on the development of biotechnology in animal breeding and veterinary medicine is presented.

### Formal prerequisites
Animal anatomy modules 1-2, Histology and embryology modules 1-2, Biochemistry modules 1-2, Animal physiology modules 1-2, Immunology

### Initial requirements
Student should have a good knowledge of the subjects mentioned above.

### Learning outcomes
As a result of activities students should acquire skills and competencies in: Artificial insemination technique; Cryopreservation of semen; Selection of donors and recipient of embryos; Diagnosis, treatment and prevention of diseases of the male reproductive system; Techniques in assisted reproduction; Describes, explains and interprets disorders on the cellular, tissue, organ, system and organism levels occurring in the course of the disease; Describes and interprets causes and symptoms of the disease, describes and interprets patomorphological changes, uses procedures for therapy and prevention in the particular diseases collects, analyses and correctly interprets clinical data, results of the laboratory tests and other diagnostics techniques describes rules for animal selection for breeding, methods of breeding and selection.
Quantitative summary of the module

Assessment methods: Two colloquia performed verifying knowledge acquired during practical classes and lectures. Final exam testing overall theoretical and practical knowledge.

Formal documentation of the learning outcome: Colloquia and exam papers, student assessment record, grade in eHMS

Elements impelling final grade: Two tests containing 65% questions from the practical material and 35% from the lectures (30 points maximum from each). A written final exam consists of 35% of the practical material and 65% of the material from the lectures (40 points maximum). During module a total of 100 points can be acquired. Final evaluation is based on the total number of points acquired. A satisfactory rating - 3, corresponds to the minimum number of points 60. The scale of number of points corresponding to the each evaluation note is as follows:

- Points Evaluation note
  - 60 – 65 3.0
  - 66 – 75 3.5
  - 76 – 85 4.0
  - 86 – 95 4.5
  - 96 – 100 5.0

Teaching base: Equine Clinic (Wolica), Small Animal Clinic (Ursynów), Centre of Animal Reproduction and Breeding in Łowicz, slaughterhouse

Obligatory and supportive materials:

Books:
2. Reproductive Technologies in Farm Animals. I. Gordon, CAB Publishing, 2005

Journals:

Annotations: Students receive all the lectures and materials for practicals in the form of a pdf printed multimedia presentation and copies of the materials selected from chapters of textbooks and journal articles in English

Estimated number of work hours per student (contact and self-study) essential to achieve presumed learning outcomes of the module: 80 h

Total ECTS points, accumulated by students during contact learning: 2 ECTS

Total ECTS points, accumulated by student during practical classes (laboratories, projects, seminars, etc.): 1 ECTS

Learning outcomes of the module relative to the learning outcomes of the subject:

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<thead>
<tr>
<th>Outcome No / symbol</th>
<th>Learning outcomes:</th>
<th>Relative to the learning outcomes of the subject</th>
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<tbody>
<tr>
<td>01</td>
<td>describes, explains and interprets disorders on the cellular, tissue, organ, system and organism levels occurring in the course of the disease</td>
<td>W_NK1</td>
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<tr>
<td>02</td>
<td>describes and interprets causes and symptoms of the disease, describes and interprets patomorphological changes, uses procedures for therapy and prevention in the particular diseases</td>
<td>W_NK3</td>
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<tr>
<td>03</td>
<td>collects, analyses and correctly interprets clinical data, results of the laboratory tests and other diagnostics techniques</td>
<td>W_NK7</td>
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<tr>
<td>04</td>
<td>describes rules for animal selection for breeding, methods of breeding and selection</td>
<td>W_PZ2</td>
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