UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
Heinzelova 55
Tel. 01/ 2390111
Division:
Department of Microbiology and Infectious Diseases with Clinic
Email:
Register no.:
File no.:
Zagreb, 10th September 2021



# COURSE SYLLABUS

Course name: **VETERINARY IMMUNOLOGY**

Academic year 2021-22

Course leader: Nevenka Rudan, distinguished professor

Teachers: Nevenka Rudan, distinguished professor; Ljiljana Pinter, distinguished professor

Associate teachers:

First day of classes: 3/ 12/ 2021

Last day of classes: 20/ 1/ 2022

## Timetable for LECTURES academic year 2021-2022

| LECTURES | | | | |
|---|---|---|---|---|
| **Date** | **Methodological unit** | **Teacher** | **Location / time** | **Literature** |
| 3.12.2021. | **1. Immune system overview: Innate and adaptive immunity (2 hours lectures)** | Nevenka Rudan | Dept. microbial. & Infect. Dis. classroom// 10-12 | Veterinary Immunology: Principles and Practice Michael J. Day, Ronald D. Schultz |
| 6. 12.2021. | **2. Antigens and antibodies (2 hours lectures)** | Ljiljana Pinter | Dept. microbial. & Infect. Dis. classroom/ 8-10 | |
| 8.12.2021. | **3. Complement system; Cells and Tissues of the Immune System (2 hours lectures)** | Ljiljana Pinter | Dept. microbial. & Infect. Dis. classroom// 14-16 | |
| 10.12.2021. | **4. The Major Histocompatibility Complex; Antigen Presentation and Cytokines (2 hours lectures)** | Ljiljana Pinter | Dept. microbial. & Infect. Dis. classroom/ 14-16 | |
| 13.12.2021. | **5. The Biology of T Lymphocytes; The Biology of B Lymphocytes (2 hours lectures)** | Nevenka Rudan | Dept. microbial. & Infect. Dis. classroom/14-16 | |
| 14.12.2021. | **6. Hypersensitivity Mechanisms (2 hours lectures)** | Ljiljana Pinter | Dept. microbial. & Infect. Dis. classroom// 8-10 | |
| 15.12.2021. | **7. Vaccination (2 hours lectures)** | Nevenka Rudan | Dept. microbial. & Infect. Dis. classroom/8-10 | |
| 22.12.2021. | **8. Immunotolerance (1 hour lecture)** | Nevenka Rudan | Dept. microbial. & Infect. Dis. classroom/ 9-10 | |
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Timetable for SEMINARS academic year 2020-2021

| SEMINARS | | | | | |
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| Date | Methodological unit | Teacher | Group | Location / time | Literature |
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## Timetable for PRACTICALS academic year 2021-2022

| PRACTICALS | | | | | | |
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| Date | Methodological unit | Teacher | Type of practical | Group | Location / time | Literature |
| 20.12.2021. | 1. Antigen, antibody (2 hours excecises) | Pinter Ljiljana | Laboratory | 3 | Dept. microbial. & Infect. Dis.practical hall/8-10 | Veterinary Immunology: Principles and Practice Michael J. Day, Ronald D. Schultz |
| 21.12.2021. | 1. Antigen, antibody (2 hours excecises) | Pinter Ljiljana | Laboratory | 1,2 | Dept. microbial. & Infect. Dis. classroom/10-12 | |
| 22.12.2021. | 2. Paired sera, titer (2 hours exercises) | Rudan Nevenka | Laboratory | 3 | Dept. microbial. & Infect. Dis.practical hall/12-14 | |
| 22.12.2021. | 2. Paired sera, titer (2 hours exercises) | Rudan Nevenka | Laboratory | 1,2 | Dept. microbial. & Infect. Dis. classroom/14-16 | |
| 23. 12.2021. | 3. Agglutination, precipitation (2 hours excecises) | Pinter Ljiljana | Laboratory | 1,2 | Dept. microbial. & Infect. Dis.practical hall/10-12 | |
| 23.12.2021. | 3. Agglutination, precipitation (2 hours excecises) | Pinter Ljiljana | Laboratory | 3 | Dept. microbial. & Infect. Dis. classroom/12-14 | |
| 10. 1. 2022. | 4. First Preliminary exam; Immunofluorescence (2 hours exercises) | Pinter Ljiljana | Laboratory | 3 | Dept. microbial. & Infect. Dis.practical hall/8-10 | |
| 11.1.2021. | . First Preliminary exam; Immunofluorescence (2 hours exercises) | Pinter Ljiljana | Laboratory | 1,2 | Dept. microbial. & Infect. Dis. classroom/8-10 | |
| 12.1.2022. | 5. ELISA, Complement-fixation test (2 hours exercises) | Pinter Ljiljana | Laboratory | 3 | Dept. microbial. & Infect. Dis.practical hall/8-10 | |
| 12.1.2022. | 5. ELISA, Complement- | Pinter Ljiljana | Laboratory | 1,2 | Dept. microbial. & Infect. Dis. classroom/10-12 | |

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| | **fixation test (2 hours exercises)** | | | | | |
| 14.1.2022. | **6. Hemagluttination-inhibition assay (2 hours exercises)** | Rudan Nevenka | Laboratory | 1,2 | Dept. microbial. & Infect. Dis.practical hall/14-16 | |
| 17.1.2022. | **6. Hemagluttination-inhibition assay (2 hours exercises)** | Rudan Nevenka | Laboratory | 3 | Dept. microbial. & Infect. Dis. classroom/8-10 | |
| 18.1.2022. | **7. Virus neutralization test (2 hours exercises)** | Rudan Nevenka | Laboratory | 3 | Dept. microbial. & Infect. Dis.practical hall/14-16 | |
| 19.1.2022. | **7. Virus neutralization test (2 hours exercises)** | Rudan Nevenka | Laboratory | 1,2 | Dept. microbial. & Infect. Dis. classroom/8-10 | |
| 20. 1.2022. | **8. Second Preliminary exam; Vaccination (1 hour exercises)** | Rudan Nevenka | Laboratory | 3 | Dept. microbial. & Infect. Dis.practical hall/12-13 | |
| 20.1.2022. | **8. Second Preliminary exam; Vaccination (1 hour exercises)** | Rudan Nevenka | Laboratory | 1,2 | Dept. microbial. & Infect. Dis. classroom/13-14 | |
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## STUDENT OBLIGATIONS

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| Lecture attendance | **Total of 15 lecture hours will hold out. Student must assemble at least 3 points (8 hours of lectures) and can gather at the most of 6 points (15 hours of lectures).** |
| Seminars attendance | |
| Practicals attendance | **Total of 15 hours of laboratory practice will hold out. Student must assemble at least 8 points (10 hours of exercises) and can gather at the most of 12 points (15 hours of exercises).** |
| Active participation in seminars and practicals | **Student must assemble at least 5 points for active participation in exercises, which involve two correct answers on the verbal putting questions. The most of 10 points involve four correct answers on the verbal putting questions.** |
| Final exam | **For approaching to final exam, student must assemble at least 36 points from these segments of teaching: lecture attendance, practical attendance, active participation in practicals and continuous knowledge-checking. Final exam is in written form and consists of 40 questions. Student must assemble at least 24 points from final exam and at the most of 40 points.** |
| Examination requirements | Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine. Given the above, the student must acquire a minimum number of points from all assessment elements in order to take the final exam. **Article 45:** a student can justifiably be absent from up to 50 % of the lectures; 30% of the seminars and 30 % of the exercises. |

## GRADING AND EVALUATING STUDENT WORK

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| Continuous knowledge-checking (mid-terms) | 10-11/1/2022; 20/1/2022 |
| Final exams (dates) | 23/11/2021; 24/1/2022; 7/2/2022 |
| Form of final exam | written |

## LITERATURE

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| Obligatory literature | Michael R Day and Ronald D Shultz: Veterinary Immunology Principles and Practice. 2st ed. Manson Publishing/The Veterinary Press |
| Optional literature | Tizard Ian: Veterinary Immunology. 9th ed. W.B. Saunders Company. A Harcourt Health Sciences Company. Philadelphia, London, Toronto, Monteral, Sydney, Tokyo, 2012. |

## OBJECTIVES AND LEARNING OUTCOMES

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| Course objectives | The veterinary immunology courses taught to second-year veterinary medical students via fifteen didactic lectures. Students get familiar with basic immunology knowledge, inflectional immunology and allergic diseases, basic knowledge of autoimmune diseases and immunomodulation. Veterinary immunology is an important preclinical course that enables student to understand other courses such as microbiology, pathology, pharmacology, internal diseases and infectious diseases, particularly regards to pathogenesis and infectious diseases diagnostics and hypersensitivity, carrying out of immunoprophylaxis and assessment of immune status. During the study students |

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| | become familiar with vaccines and their usage, simple immunology diagnostic procedures and use of commercially available vaccines. |
| Learning outcomes | **Student will/will be able to**:<br>1. **Knowing** of innate immunity mechanisms, inflammation and its role in course of immune response cells of immune system and their enrolment in immune reaction, adaptive immunity to microbs and parasites, mucosal immunity;<br>2. **Understand** function and role of complement system, cytokines, antigens, dendritic cells, major histocompatibility complex, cells and tissues of the immune system;<br>3. **Understand** mechanisms of adaptive immunity, antibody synthesis, immunity of fetus and newborn animals;<br>4. **Use** adoptive knowledge about hypersensitivity mechanisms, production and usage of vaccines, adjuvants and their immunomodulatory activity. |

## GRADING SCHEME

| *Points* | *Grade* |
|---|---|

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|---|---|
| Up to 59 | 1 (F) |
| 60-68 | 2 (E) |
| 69-76 | 2 (D) |
| 77-84 | 3 (C) |
| 85-92 | 4 (B) |
| 93-100 | 5 (A) |

Course leader:

Prof Nevenka Rudan, DVM, PhD

Head of Department/Clinic:

Prof Vilim Starešina, DVM, PhD

Note: The course leader is required to submit a Course Syllabus to all teachers and associates pertaining to the Course.