

UNIVERSITY OF ZAGREB  
FACULTY OF VETERINARY MEDICINE

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Division: Department of Animal Production and Biotechnology

Organizational unit: Unit of Animal Nutrition and Dietetics

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Register No of the organizational unit: 61-07-25-25

Zagreb, 11/02/2025

|                                                                                     |                      |
|-------------------------------------------------------------------------------------|----------------------|
|  |                      |
| 198045                                                                              | REPUBLIKA HRVATSKA   |
| Veterinarski fakultet u Zagrebu                                                     |                      |
| Primljeno:                                                                          | 11.02.2025           |
| Klasifikacijska oznaka                                                              | Org. jed.            |
| 602-04/24-22/38                                                                     | 251-61-41;251-61-32; |
| Urudžbeni broj                                                                      | Prilozi Vrijednost   |
| 251-61-07-25-144                                                                    | 0 -                  |

## COURSE SYLLABUS

### APPLIED ANIMAL NUTRITION

Academic year 2024/2025

Course leader: Prof. Hrvoje Valpotić

Deputy course leader: Assoc. Prof. Diana Brozić

Teachers: Full Prof. Željko Mikulec, Full Prof. Tomislav Mašek, Assoc. Prof. Hrvoje Valpotić, Assoc. Prof. Diana Brozić, teaching assistant Ana Marija Kovač, DVM

First day of classes: 18/03/2025

Last day of classes: 12/06/2025

| Activities - Applied animal nutrition (1/4) |         |        |                                                  |                  |      |        |                        |                 |
|---------------------------------------------|---------|--------|--------------------------------------------------|------------------|------|--------|------------------------|-----------------|
| Start Date                                  | Start T | End Ti | Subject                                          | Group            | Note | Length | Instructor             | Room            |
| 18/03/2025                                  | 13:15   | 14:45  | p01 Nutrition in different stages of development | 4E-1, 4E-2, 4E-3 |      | 1:30   | Valpotic H.            | P_kemija        |
| 25/03/2025                                  | 14:00   | 15:30  | p02 Feeding dairy cows                           | 4E-1, 4E-2, 4E-3 |      | 1:30   | Valpotic H.            | P_farmakologija |
| 01/04/2025                                  | 11:00   | 12:30  | p03 Calf nutrition. Feeding beef cattle          | 4E-1, 4E-2, 4E-3 |      | 1:30   | Mikulec Ž.             | P_fiziologija   |
| 03/04/2025                                  | 8:15    | 9:45   | p04 Sheep nutrition                              | 4E-1, 4E-2, 4E-3 |      | 1:30   | Mikulec Ž.             | P_fizika        |
| 03/04/2025                                  | 12:45   | 14:15  | v01 Dairy cows                                   | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 03/04/2025                                  | 14:30   | 16:00  | v01 Dairy cows                                   | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 09/04/2025                                  | 13:00   | 13:45  | p05 Goat nutrition                               | 4E-1, 4E-2, 4E-3 |      | 0:45   | Mikulec Ž.             | P_fiziologija   |
| 10/04/2025                                  | 8:15    | 9:45   | p06 Feeding sows and boars                       | 4E-1, 4E-2, 4E-3 |      | 1:30   | Valpotic H.            | P_fizika        |
| 10/04/2025                                  | 11:30   | 13:00  | v02 Dairy cows, beef cattle                      | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_fizika        |
| 10/04/2025                                  | 13:00   | 14:30  | v02 Dairy cows, beef cattle                      | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_fizika        |
| 14/04/2025                                  | 10:00   | 11:30  | v03 Feeding dairy cows                           | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_fiziologija   |
| 14/04/2025                                  | 12:30   | 14:00  | v03 Feeding dairy cows                           | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_fiziologija   |
| 15/04/2025                                  | 12:45   | 14:15  | v04 Sheep and goat                               | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 16/04/2025                                  | 12:00   | 13:30  | v04 Sheep and goat                               | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_amfiteatar    |

### Activities - Applied animal nutrition (2/4)

| Start Date | Start T | End Ti | Subject                                              | Group            | Note | Length | Instructor             | Room            |
|------------|---------|--------|------------------------------------------------------|------------------|------|--------|------------------------|-----------------|
| 22/04/2025 | 14:00   | 15:30  | p07 Feeding piglets. Feeding growing-finishing pigs. | 4E-1, 4E-2, 4E-3 |      | 1:30   | Valpotic H.            | P_fiziologija   |
| 23/04/2025 | 12:00   | 13:30  | v05 Swine I                                          | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 24/04/2025 | 12:30   | 14:00  | v05 Swine I                                          | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 24/04/2025 | 14:15   | 15:45  | p08 Feeding poultry                                  | 4E-1, 4E-2, 4E-3 |      | 1:30   | Mikulec Ž.             | P_patologija    |
| 25/04/2025 | 10:00   | 16:00  | t01                                                  | 4E-1, 4E-2, 4E-3 |      | 6:00   | Nastavnici na predmetu |                 |
| 05/05/2025 | 8:30    | 9:15   | p09 Feeding poult                                    | 4E-1, 4E-2, 4E-3 |      | 0:45   | Mikulec Ž.             | P_fiziologija   |
| 07/05/2025 | 10:00   | 11:30  | v06 Swine II                                         | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 07/05/2025 | 11:45   | 13:15  | v06 Swine II                                         | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 12/05/2025 | 10:15   | 11:45  | p10 Dog and cat nutrition                            | 4E-1, 4E-2, 4E-3 |      | 1:30   | Mikulec Ž.             | P_fizika        |
| 12/05/2025 | 12:00   | 13:30  | v07 Poultry                                          | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_farmakologija |
| 13/05/2025 | 12:00   | 13:30  | v07 Poultry                                          | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 14/05/2025 | 10:00   | 16:00  | t02                                                  | 4E-1, 4E-2, 4E-3 |      | 6:00   | Nastavnici na predmetu |                 |
| 15/05/2025 | 15:15   | 16:00  | p11 Dog and cat nutrition                            | 4E-1, 4E-2, 4E-3 |      | 0:45   | Brozic D.              | P_patologija    |
| 19/05/2025 | 12:00   | 13:30  | v08 Dog and cat I                                    | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 20/05/2025 | 12:15   | 13:00  | p12 Feeding horses                                   | 4E-1, 4E-2, 4E-3 |      | 0:45   | Brozic D.              | P_patologija    |

### Activities - Applied animal nutrition (3/4)

| Start Date | Start T | End Ti | Subject                              | Group            | Note | Length | Instructor             | Room            |
|------------|---------|--------|--------------------------------------|------------------|------|--------|------------------------|-----------------|
| 20/05/2025 | 13:15   | 14:45  | v08 Dog and cat I                    | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 22/05/2025 | 8:15    | 9:45   | p13 Feeding horses                   | 4E-1, 4E-2, 4E-3 |      | 1:30   | Brozic D.              | P_farmakologija |
| 23/05/2025 | 10:00   | 16:00  | t03                                  | 4E-1, 4E-2, 4E-3 |      | 6:00   | Nastavnici na predmetu |                 |
| 26/05/2025 | 13:00   | 14:30  | v09 Dog and cat II                   | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 27/05/2025 | 10:30   | 12:00  | v09 Dog and cat II                   | 4E-1, 4E-2, 4E-3 |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 27/05/2025 | 12:30   | 14:00  | p14 Feeding rabbits                  | 4E-1, 4E-2, 4E-3 |      | 1:30   | Brozic D.              | P_fizika        |
| 28/05/2025 | 12:00   | 12:45  | p15 Game nutrition                   | 4E-1, 4E-2, 4E-3 |      | 0:45   | Mikulec Ž.             | P_patologija    |
| 28/05/2025 | 13:00   | 14:30  | v10 Dog and cat III                  | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 29/05/2025 | 8:15    | 9:45   | v10 Dog and cat III                  | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_patologija    |
| 02/06/2025 | 7:45    | 9:15   | v11 Horses                           | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_kemija        |
| 03/06/2025 | 10:00   | 11:30  | v11 Horses                           | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_kemija        |
| 04/06/2025 | 14:00   | 15:30  | v12 Feeding horses. Rabbit nutrition | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_kemija        |
| 05/06/2025 | 12:00   | 13:30  | v12 Feeding horses. Rabbit nutrition | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_kemija        |
| 09/06/2025 | 9:15    | 10:45  | v13 Rodent nutrition                 | 4E-1, 4E-2       |      | 1:30   | Nastavnici na predmetu | P_fiziologija   |

| Activities - Applied animal nutrition (4/4) |         |        |                                 |                  |      |        |                        |               |
|---------------------------------------------|---------|--------|---------------------------------|------------------|------|--------|------------------------|---------------|
| Start Date                                  | Start T | End Ti | Subject                         | Group            | Note | Length | Instructor             | Room          |
| 09/06/2025                                  | 11:00   | 12:30  | v13 Rodent nutrition            | 4E-3             |      | 1:30   | Nastavnici na predmetu | P_fiziologija |
| 12/06/2025                                  | 10:00   | 16:00  | t04                             | 4E-1, 4E-2, 4E-3 |      | 6:00   | Nastavnici na predmetu |               |
|                                             |         |        | Applied animal nutrition, Ispit |                  | Exam | 1:00   | Valpotic H.            | P_kemija      |
|                                             |         |        | Applied animal nutrition, Ispit |                  | Exam | 1:00   | Valpotic H.            | P_kemija      |
|                                             |         |        | Applied animal nutrition, Ispit |                  | Exam | 1:00   | Valpotic H.            | P_kemija      |
|                                             |         |        | Applied animal nutrition, Ispit |                  | Exam | 1:00   | Valpotic H.            | P_kemija      |
| Total: 49                                   |         |        |                                 |                  |      | 85:45  |                        |               |



**STUDENT OBLIGATIONS**

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lecture attendance                              | During the session of the "Applied Animal Nutrition" course, the student must attend 13 lecture lessons to gain a minimum of 3 points. The maximum number of points from this evaluation element is 6 points. Students who don't obtain a minimum of required points for the attendance of lectures are not eligible for the exam.                                                                                                                                                                                                                                                                                                                                           |
| Practicals attendance                           | During the session of the "Applied Animal Nutrition" course, the student must attend 34 practical lessons to gain a minimum of 8 points. The maximum number of points from this evaluation element is 12 points. Students who don't obtain a minimum of required points for the attendance of practicals are not eligible for the exam.                                                                                                                                                                                                                                                                                                                                      |
| Active participation in seminars and practicals | During the session at the time of practicals, the students will be given a short-announced quiz. Minimum number of points to pass this evaluation is 5. Students who don't obtain a minimum of required points for the activity or are not present at the time of the quiz are not eligible for the exam. The maximum number of points that a student can gain on the quiz is 10.                                                                                                                                                                                                                                                                                            |
| Final exam                                      | The final exam will consist of a written and oral part. The written exam will consist of 20 questions, each of which is worth 1 point. The written exam is in the form of multiple-choice (a to d) with only one correct answer. Students who do not achieve a minimum number of points in the written part of the final exam (less than 12) cannot take the oral exam. Students who achieve a sufficient number of points (12 to 20) are eligible for the oral exam. A maximum of 20 points can be obtained in the oral exam, and the minimum number of points that must be obtained is 12. The final grade consists of the sum of the points of the written and oral exam. |
| Examination requirements                        | Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine (2023). Given the above, the student must acquire a minimum number of points from all assessment elements to take the final exam. Under Article 45, paragraphs 3 and 4 of the Regulations on Integrated Undergraduate and Graduate Studies (2023): a student can justifiably be absent from up to 50 % of the lectures; 30% of the seminars, and 30 % of the practicals.                                                                                                                                                                       |

**GRADING AND EVALUATING STUDENT WORK**

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Continuous knowledge-checking (mid-terms) | During the session one mid-term will be organized, made out of 32 questions or problems. Each correctly solved problem or answered question is worth 1 point. A student must gain a total of a minimum of 20 points from the mid-term. The maximum number of points from this evaluation is 32 points. Students will have 2 terms to complete this evaluation element. Students who don't obtain a minimum of required points or are not present at all mid-terms in admitted time are not eligible for the exam. |
| Mid-term (dates)                          | 17.6.2025., 20.6.2025.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Final exams (dates)                       | 26.6.2025., 9.7.2025., 5.9.2025., 15.9.2025.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Form of final exam                        | Written and oral                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**LITERATURE**

|                       |                                                                                                                                                                               |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Obligatory literature | 1. CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. 3rd ed., Pearson Prentice Hall, USA.                                                                    |
| Optional literature   | 1. POND, W. G., D. C. CHURCH, K. R. POND (1995): Basic Animal Nutrition and Feeding. 4 <sup>th</sup> ed., John Wiley and Sons Inc., USA.                                      |
|                       | 2. MCDONALD, P., R. A. EDWARDS, J. F. D. GREENHALGH, C. A. MORGAN, L. A. SINCLAIR, R. G. WILKINSON (2010): Animal Nutrition. 7 <sup>th</sup> ed., Pearson Prentice Hall, USA. |

**OBJECTIVES AND LEARNING OUTCOMES**

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Course objectives</b> | Upon completion of the lectures and after passing the final exam of "Applied Animal Nutrition" the students will be able to recognize the conditions in the field and to take feed samples for chemical analysis. They will also know the right procedure for taking samples for analysis and super analysis and to correctly interpret the results. The acquired skills will enable them to individually formulate balanced rations and feedstuffs for all species and categories of animals. They will also be able to recognize specific nutrient deficiencies and malnutrition in domestic and wild animals which could have a negative effect on the health status and their productivity. Students will be capable of determining and applying preventive and therapeutic feeding in cases of metabolic disorders of high-producing animals. Besides field work the students will be capable of working in feed mills and in other biomedical fields which require basic knowledge of veterinary nutrition. |
| <b>Learning outcomes</b> | Upon successful completion of the course, students will be able to:<br><ol style="list-style-type: none"><li>1. Categorize the characteristics of feeding different species of domestic and wild animals in certain physiological periods</li><li>2. Categorize the daily nutritive needs of animals according to the tables of nutritional requirements, biological experiments and practical experience</li><li>3. Categorize deficiencies in feed of domestic and wild animals</li><li>4. Manual and computer formulation of rations for certain species and categories of animals</li><li>5. Adjust feeding regimes for different species and categories of animals in practical farm conditions and revise inappropriate feeding</li></ol>                                                                                                                                                                                                                                                                   |

**GRADING SCHEME**

| <i>Points</i> | <i>Grade</i> |
|---------------|--------------|
| Up to 59      | 1 (F)        |
| 60-76         | 2 (D,E)      |
| 77-84         | 3 (C)        |
| 85-92         | 4 (B)        |
| 93-100        | 5 (A)        |

Course leader:



Head of organizational unit:

