

APPLIED ANIMAL NUTRITION

UNIVERSITY OF ZAGREB  
FACULTY OF VETERINARY MEDICINE  
Heinzelova 55  
Tel. 01/2390-274  
Division: Animal Production and Biotechnology  
Organizational unit: Animal Nutrition and Dietetics  
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Register No of the organisational unit: 61-07-23-18  
Zagreb, 28/02/2023

## **COURSE SYLLABUS**

APPLIED ANIMAL NUTRITION

Academic year 2022/2023

Course leader: Full Prof. Željko Mikulec

Deputy course leader: Assoc. Prof. Hrvoje Valpotić

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

First day of classes: 27/02/2023

Last day of classes: 15/05/2023

### Timetable for LECTURES academic year 2022/2023

LECTURES				
Date	Methodological unit	Teacher	Location / Time	Literature
27/02/2023 1 <sup>st</sup> lecture	Nutrition in different stages of development and production Factors affecting feed consumption	Associate Professor Hrvoje Valpotić	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
28/02/2023 2 <sup>nd</sup> lecture	Feeding dairy cows	Associate Professor Hrvoje Valpotić	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
02/03/2023 3 <sup>rd</sup> lecture	Calf nutrition Feeding beef cattle	Full professor Željko Mikulec	Practical Hall of Animal Hygiene, Behaviour and Welfare (12 am- 2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
03/03/2023 4 <sup>th</sup> lecture	Sheep nutrition	Full professor Željko Mikulec	Practical Hall of Animal Hygiene, Behaviour and Welfare (8am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
06/03/2023 5 <sup>th</sup> lecture	Goat nutrition	Full professor Željko Mikulec	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-3pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
13/03/2023 6 <sup>th</sup> lecture	Feeding sows and boars	Associate Professor Hrvoje Valpotić	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
16/03/2023 7 <sup>th</sup> lecture	Feeding piglets Feeding growing-finishing pigs	Associate Professor Hrvoje Valpotić	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
20/03/2023 8 <sup>th</sup> lecture	Feeding poultry	Full professor Željko Mikulec	Lecture room of Pathology (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
22/03/2023 9 <sup>th</sup> lecture	Feeding poultry	Full professor Željko Mikulec	Practical Hall of Animal Hygiene, Behaviour and Welfare	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.).

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			(8am-9am)	Pearson Prentice Hall, USA. + lecture materials
22/03/2023 10 <sup>th</sup> lecture	Dog and cat nutrition	Assistant Professor Diana Brozić	Practical Hall of Animal Hygiene, Behaviour and Welfare (9am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
30/03/2023 11 <sup>th</sup> lecture	Dog and cat nutrition	Assistant Professor Diana Brozić	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-1pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
30/03/2023 12 <sup>th</sup> lecture	Feeding horses	Assistant Professor Diana Brozić	Practical Hall of Animal Hygiene, Behaviour and Welfare (1pm-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
14/04/2023 13 <sup>th</sup> lecture	Feeding horses	Assistant Professor Diana Brozić	Lecture room of Physiology (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
19/04/2023 14 <sup>th</sup> lecture	Feeding rabbits	Assistant Professor Diana Brozić	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials
20/04/2023 15 <sup>th</sup> lecture	Game nutrition	Full professor Željko Mikulec	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-1pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + lecture materials

### Timetable for PRACTICALS academic year 2022/2023

PRACTICALS						
Date	Methodological unit	Teacher	Type of practical (Article 31. of Regulation)	Group	Location / time	Literature
03/03/2023 1 <sup>st</sup> practical	Feeding dairy cows	Assistant Professor Diana Brozić Associate Professor Hrvoje Valpotić	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
03/03/2023 1 <sup>st</sup> practical	Feeding dairy cows	Associate Professor Hrvoje Valpotić	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
07/03/2023 2 <sup>nd</sup> practical	Feeding dairy cows Feeding beef cattle	Ana Marija Kovač, DVM	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
08/03/2023 2 <sup>nd</sup> practical	Feeding dairy cows Feeding beef cattle	Assistant Professor Diana Brozić Ana Marija Kovač, DVM	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
14/03/2023 3 <sup>rd</sup> practical	Feeding dairy cows	Associate Professor Hrvoje Valpotić	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (8am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
15/03/2023 3 <sup>rd</sup> practical	Feeding dairy cows	Assistant Professor Diana Brozić Associate Professor Hrvoje Valpotić	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals

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16/03/2023 4 <sup>th</sup> practical	Sheep and goat nutrition	Full professor Željko Mikulec	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
17/03/2023 4 <sup>th</sup> practical	Sheep and goat nutrition	Full professor Željko Mikulec Associate Professor Hrvoje Valpotić	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (8am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
24/03/2023 1 <sup>st</sup> field course	Feeding beef cattle	Associate Professor Hrvoje Valpotić Assistant Professor Diana Brozić Ana Marija Kovač, DVM	Field course	1, 2, 3	Poljanski Lug (10am-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
27/03/2023 5 <sup>th</sup> practical	Swine nutrition I	Associate Professor Hrvoje Valpotić	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
29/03/2023 5 <sup>th</sup> practical	Swine nutrition I	Associate Professor Hrvoje Valpotić Full professor Željko Mikulec	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (4pm-6pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
31/03/2023 6 <sup>th</sup> practical	Swine nutrition II	Associate Professor Hrvoje Valpotić	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (8am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
03/04/2023 6 <sup>th</sup> practical	Swine nutrition II	Associate Professor Hrvoje Valpotić Assistant Professor Diana Brozić	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (3pm-5pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals

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04/04/2023 7 <sup>th</sup> practical	Feeding poultry	Full professor Željko Mikulec Ana Marija Kovač, DVM	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (11am-1pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
04/04/2023 7 <sup>th</sup> practical	Feeding poultry	Ana Marija Kovač, DVM	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (1pm-3pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
12/04/2023 2 <sup>nd</sup> field course	Dairy cow nutrition	Associate Professor Hrvoje Valpotić Assistant Professor Diana Brozić Ana Marija Kovač, DVM	Field course	1, 2, 3	Križevci (10am-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
14/04/2023 8 <sup>th</sup> practical	Dog and cat nutrition I	Assistant Professor Diana Brozić	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (8am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
14/04/2023 8 <sup>th</sup> practical	Dog and cat nutrition I	Assistant Professor Diana Brozić Associate Professor Hrvoje Valpotić	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
17/04/2023 9 <sup>th</sup> practical	Dog and cat nutrition II	Assistant Professor Diana Brozić Associate Professor Hrvoje Valpotić	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (10am-12am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
17/04/2023 9 <sup>th</sup> practical	Dog and cat nutrition II	Assistant Professor Diana Brozić	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals

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18/04/2023 10 <sup>th</sup> practical	Dog and cat nutrition III	Assistant Professor Diana Brozić Associate Professor Hrvoje Valpotić	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (8am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
25/04/2023 10 <sup>th</sup> practical	Dog and cat nutrition III	Assistant Professor Diana Brozić	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (2pm-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
27/04/2023 3 <sup>rd</sup> field course	Feeding horses	Assistant Professor Diana Brozić Associate Professor Hrvoje Valpotić Ana Marija Kovač, DVM	Field course	1, 2, 3	Bjelovar (10am-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
08/05/2023 11 <sup>th</sup> practical	Feeding horses	Assistant Professor Diana Brozić Ana Marija Kovač, DVM	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (8am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
09/05/2023 12 <sup>th</sup> practical	Feeding horses Rabbit nutrition	Assistant Professor Diana Brozić Ana Marija Kovač, DVM	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (8am-10am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
10/05/2023 11 <sup>th</sup> practical	Feeding horses	Assistant Professor Diana Brozić	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
11/05/2023 12 <sup>th</sup> practical	Feeding horses Rabbit nutrition	Ana Marija Kovač, DVM	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals

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12/05/2023 4 <sup>th</sup> field course	Feeding cows	Assistant Professor Diana Brozić Associate Professor Hrvoje Valpotić Full professor Željko Mikulec	Field course	1, 2, 3	Sljeme (10am-4pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
15/05/2023 13 <sup>th</sup> practical	Laboratory animal feeding and nutrition Rabbit nutrition	Ana Marija Kovač, DVM	Practicum	3	Practical Hall of Animal Hygiene, Behaviour and Welfare (10am-12am)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals
15/05/2023 13 <sup>th</sup> practical	Laboratory animal feeding and nutrition Rabbit nutrition	Assistant Professor Diana Brozić Ana Marija Kovač, DVM	Practicum	1, 2	Practical Hall of Animal Hygiene, Behaviour and Welfare (12am-2pm)	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA. + material from practicals

## STUDENT OBLIGATIONS

Lecture attendance	During the session of the "Applied Animal Nutrition" course the student must attend 13 lecture lessons in order to gain 3 minimal points. Maximal number of points from this evaluation element is 6 points. Students that don't obtain a minimum of required points for the attendance of lectures are not eligible for exam.
Practicals attendance	During the session of the "Applied Animal Nutrition" course the student must attend 34 practical lessons in order to gain 8 minimal points. Maximal number of points from this evaluation element is 12 points. Students that don't obtain a minimum of required points for the attendance of practicals are not eligible for 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 that don't obtain a minimum of required points for activity or are not present at the time of the quiz are not eligible for exam. The maximum number of points that student can gain at the quiz is 10.
Final exam	The final exam will be held in oral form. At the final exam a student is given 5 questions each worth 8 points. The maximum number of points a student can gain at the final exam is 40. The student must gain a minimum of 24 points from this evaluation element.
Examination requirements	Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine (2022). Given the above, the student must acquire a minimum number of points from all assessment elements in order to take the final exam. <b>Article 41:</b> a student can justifiably be absent from up to 50 % of the lectures; 20% of the seminars and 20 % of the exercises.



**GRADING AND EVALUATING STUDENT WORK**

Continuous knowledge-checking (mid-terms)	During the session one mid-term will be organised at the time of the lessons, made out of 32 questions or problems. Each correctly solved problem or answered question is worth 1 point. A student must gain the total of 20 points min from the mid-term. The maximum number of points from this evaluation is 32 points. Student will have three terms to complete this evaluation element. Students that don't obtain a minimum of required points or are not present at all mid-terms in admitted time are not eligible for exam.
Final exams (dates)	29/3/2023, 22/5/2023., 27/6/2023., 11/7/2023., 4/9/2023., 19/9/2023.
Form of final exam	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, P. R. Pond (1995): Basic Animal Nutrition and Feeding (Fourth Edition). 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 (Seventh edition). Pearson Prentice Hall, USA.

**OBJECTIVES AND LEARNING OUTCOMES**

Course objectives	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 of 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 products. 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.
Learning outcomes	Upon successful completion of the course students will be able to: 1. Knowing the characteristics of feeding different species of domestic and wild animals in certain physiological periods 2. Estimating the daily nutritive needs of animals according to the tables of nutritional requirements, biological experiments and practical experience 3. Recognize deficiencies in feed of domestic and wild animals 4. Applied manual and computer assembling meals for certain species and categories of animals 5. Recommend proper feeding for different species and categories of animals in practical farm conditions and corrections for inappropriate feeding

**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:

