Course: Food Hygiene and Technology

UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
Heinzelova 55
Tel. 01/2390-123
Division: VETERINARY PUBLIC HEALTH AND FOOD SAFETY
Organizational unit: Hygiene, Technology and Food Safety
E-mail of the course leader: nzdolec@vef.hr
Register No of the organisational unit:
Zagreb, 10/2/2023

COURSE SYLLABUS

Course name: Food Hygiene and Technology

Academic year 2022/2023

Course leader: Assoc. Prof. Nevijo Zdolec
Deputy course leader: Full Prof. Lidija Kozačinski

Teachers: Full Prof. Željka Cvrtila, Full Prof. Lidija Kozačinski, Assoc. Prof. Nevijo Zdolec, Assist. Prof. Tomislav Mikuš, teaching assistant Marta Kiš, DVM

First day of classes: 28/2/2023
Last day of classes: 05/05/2023

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Timetable for LECTURES academic year 2022/2023

LECTURES				
Date	**Methodological unit**	**Teacher**	**Location / Time**	**Literature**
28/2/2023 1st lecture	Thermally non-processed meat products	Assoc. Prof. Nevijo Zdolec	Lecture Room Microbiology (8am-10am)	ZDOLEC, N. (2017): Fermented Meat Products: Health Aspects. CRC Taylor & Francis, USA.
01/03/2023 2nd lecture	Thermally processed meat products	Full prof. Lidija Kozačinski	Lecture Room Microbiology (14pm-16pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG. MEAD, G.C. (2004): Poultry meat processing and quality. CRC Press. USA.
02/03/2023 3rd lecture	Food Fraud	Full Prof. Željka Cvrtila	Lecture Room Microbiology (14pm-16pm)	Lecture materials
03/03/2023 4th lecture	Milk and dairy products	Assoc. Prof. Nevijo Zdolec	Lecture Room Microbiology (13pm-15pm)	CHANDAN, C.R., A. KILARA, N. P. SHAH (2008): Dairy Processing & Quality Assurance. A John Wiley & Sons, Ltd., Publication, USA. Legislative acts.
07/03/2023 5th lecture	Veterinary controls in milk production (Hygiene, dairy microbiology and zoonoses, mastitis, quality and health requirements)	Assoc. Prof. Nevijo Zdolec	Lecture Room Microbiology (14pm-16pm)	CHANDAN, C.R., A. KILARA, N. P. SHAH (2008): Dairy Processing & Quality Assurance. A John Wiley & Sons, Ltd., Publication, USA. Legislative acts.
13/3/2023 6th lecture	Hygienic-technological aspects of dairy production (transport, cooling, processing and control of raw materials, Heat treatment of milk and microbiological risks)	Assoc. Prof. Nevijo Zdolec	Lecture Room Physiology (12pm-14pm)	CHANDAN, C.R., A. KILARA, N. P. SHAH (2008): Dairy Processing & Quality Assurance. A John Wiley&Sons, Ltd., Publication, USA.

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27/3/2023 7th lecture	Chemical composition of milk and dairy products (Sensory and physical-chemical properties of milk and products. Milk types. Nutritional and energy value of milk and dairy products; labelling	Full Prof. Željka Cvrtila	Practical hall Microbiology (11am-13pm)	CHANDAN, C.R., A. KILARA, N. P. SHAH (2008): Dairy Processing & Quality Assurance. A John Wiley&Sons, Ltd., Publication, USA.
30/3/2023 8th lecture	Determining the quality of dairy products. Packaging of milk and dairy products. Additives. Allergens	Full Prof. Željka Cvrtila	Practical hall Microbiology (11am-13pm)	CHANDAN, C.R., A. KILARA, N. P. SHAH (2008): Dairy Processing & Quality Assurance. A John Wiley&Sons, Ltd., Publication, USA.
12/4/2023 9th lecture	Hygienic-technological aspects of dairy production (fermented dairy products, cream, butter, condensed milk and milk powder)	Full Prof. Lidija Kozačinski	Lecture Room Microbiology (13pm-15pm)	CHANDAN, C.R., A. KILARA, N. P. SHAH (2008): Dairy Processing & Quality Assurance. A John Wiley&Sons, Ltd., Publication, USA.
14/4/2023 10th lecture	Hygienic-technological aspects of cheese production. HACCP and official controls in dairy processing	Full Prof. Lidija Kozačinski	Lecture Room Physiology (9am-11am)	CHANDAN, C.R., A. KILARA, N. P. SHAH (2008): Dairy Processing & Quality Assurance. A John Wiley & Sons, Ltd., Publication, USA.
17/4/2023 11th lecture	Eggs (Technology of production and processing of eggs. Hygienic-technological norms of egg processing.) Honey (Production and quality of honey)	Full Prof. Željka Cvrtila	Practical hall Microbiology (10am-12pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
19/4/2023 12th lecture	Veterinary inspection of fish. Evaluation of the quality and freshness of fish, crustaceans, shellfish; stunning fish. Parasites, pathogenic microorganisms	Assist. Prof. Tomislav Mikuš	Lecture Room Microbiology (12pm-14pm)	BORDA, D., A. I. NICOLAU, P. RASPOR (2018): Trends in Fish Processing Technologies. CRC Taylor & Francis, USA.
25/4/2023 13th lecture	Composition and quality of fish, crustaceans and shellfish (structure and composition of fish. Classification and categorization of fish, crustaceans and shellfish.	Full Prof. Lidija Kozačinski	Practical hall Microbiology (14pm-16pm)	BORDA. D., A. I. NICOLAU, P. RASPOR (2018): Trends in Fish Processing Technologies. CRC Taylor & Francis, USA.

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	Postmortem changes and spoilage of fish. Biogenic amines and biotoxins in fish)			
26/4/2023 14th lecture	Hygiene and technology of fish products production (processing and veterinary control in the trade of fish and fish products. Hygienic-technological norms of production and quality assessment of fish products	Assist. Prof. Tomislav Mikuš	Practical hall Microbiology (10am-12pm)	BORDA. D., A. I. NICOLAU, P. RASPOR (2018): Trends in Fish Processing Technologies. CRC Taylor & Francis, USA.
02/05/2023 15th lecture	Other alternative foods of animal origin and future food safety guidelines	Full Prof. Lidija Kozačinski	Lecture Room Microbiology (14pm-16pm)	Lecture materials

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Timetable for PRACTICALS academic year 2022/2023

PRACTICALS						
Date	**Methodological unit**	**Teacher**	**Type of practical** (Article 31. of Regulation)	**Group**	**Location / time**	**Literature**
27/2/2023 1st practical	Meat processing and official controls	Assoc. Prof. Nevijo Zdolec teaching assistant Marta Kiš, DVM	field course	1,2	PIK VRBOVEC Vrbovec (9am-14pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
10/3/2023 2nd practical	Controls in retail	Assist. Prof. Tomislav Mikuš teaching assistant Marta Kiš, DVM	field course	1,2	City Market Dolac (10am-12pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
10/3/2023 3rd practical	Testing of milk freshness and fat content	Full Prof. Željka Cvrtila teaching assistant Marta Kiš, DVM	laboratory practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (13pm-16pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
14/3/2023 4th practical	Density of milk. Milk adulteration	Full Prof.Željka Cvrtila Assist. Prof. Tomislav Mikuš	laboratory practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (12pm-14pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015):

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						Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
15/3/2023 5th practical	Milk processing, cheese production, controls	teaching assistant Marta Kiš, DVM Assoc. Prof. Nevijo Zdolec	field course	1,2	DAIRY-CHEESE PLANT Šenkovec (9am-14pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
16/3/2023 6th practical	Hygienic quality of milk 1	teaching assistant Marta Kiš, DVM Assoc. Prof. Nevijo Zdolec	laboratory practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (12pm-14pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
20/3/2023 7th practical	Hygienic quality of milk 2	teaching assistant Marta Kiš, DVM Assoc. Prof. Nevijo Zdolec	construction practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (13pm-15pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
22/3/2023 8th practical	Hygiene and technology of fermented milk and cheese	Assist. Prof. Tomislav Mikuš teaching assistant Marta Kiš, DVM	laboratory practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (13pm-17pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of

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						Veterinary Medicine, UNIZG.
03/04/2023 9th practical	Hygiene and technology of butter other dairy products	Assist. Prof. Tomislav Mikuš teaching assistant Marta Kiš, DVM	laboratory practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (14pm-16pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
21/4/2023 10th practical	Eggs	Assist. Prof. Tomislav Mikuš teaching assistant Marta Kiš, DVM	laboratory practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (10am-12pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
24/4/2023 11th practical	HACCP Microbiological standards	Assoc. Prof. Nevijo Zdolec teaching assistant Marta Kiš, DVM	construction practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (8am-12pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.
26/4/2023 12th practical	Fish	teaching assistant Marta Kiš, DVM Full Prof. Željka Cvrtila	laboratory practicals	1,2	Practicals at Hygiene, Technology and Food Safety unit (12pm-15pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.

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05/05/2023 13th practical	Meat processing and official controls	Assist. Prof. Tomislav Mikuš teaching assistant Marta Kiš, DVM	field course	1,2	Meat processing plant Vajda Čakovec (9am-14pm)	KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG.

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STUDENT OBLIGATIONS

Lecture attendance	Classes are held during 60 hours of lectures. In order to achieve a minimum of 3 points, a student should attend 30 hours of lectures. Attendance at one hour of lectures is scored with 0.1 points (a maximum of 6 points can be collected, or 60 hours x 0.1 points).
Seminars attendance	-
Practicals attendance	Classes are held through 105 hours of exercises (28 hours of special clinical exercises, 20 field course, 38 laboratory exercises and 19 construction exercises). In order to achieve the minimum number of points (8), the student should be present in 84 hours of exercises. The maximum number of points that can be collected during 105 hours of exercises is 12.
Active participation in seminars and practicals	The maximum number of points that a student can collect is 10. To achieve this, he/she must collect a maximum of 5 points per semester for preparation for the exercise and positive answers during field and laboratory exercises (each activity is 2.5 points). The minimum number of points that a student should collect per semester is 2.5.
Final exam	The final exam includes all the results of monitoring activities during classes. The exam is oral. At the oral exam, the student answers 10 questions, with each correct answer being scored with 4 points. The maximum number of points for the oral exam is 40. The minimum number of points is 24, and for a student to achieve them, he/she must answer at least 6 questions (24 points) correctly.
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 41:** a student can justifiably be absent from up to 50 % of the lectures and 20 % of the exercises.

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GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	The student must attend the first organized term of the test. In case of justified absence (medical proof), the student can access the remedial test. The first preliminary test (end of the IX sem) covers teaching units referring to veterinary control in meat production (4 questions) and lab exercises (4 questions). The second preliminary test (X sem) covers veterinary inspection, control and examination of milk, fish, eggs, honey and other foodstuffs and technological processing in production of milk, fish, eggs, honey and other foodstuffs (4 questions) and lab exercises (4 questions).
Final exams (dates)	15/5/2023,13/6/2023, 27/6/2023,11/7/2023, 04/09/2023, 20/9/2023
Form of final exam	Oral exam

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LITERATURE

Obligatory literature	**BORDA. D., A. I. NICOLAU, P. RASPOR** (2018): Trends in Fish Processing Technologies. CRC Taylor & Francis, USA. **CHANDAN, C.R., A. KILARA, N. P. SHAH** (2008): Dairy Processing & Quality Assurance. A John Wiley&Sons, Ltd., Publication, USA. **COLLINS D.S., R. J. HUEY** (2015): Gracey's Meat hygiene. 11th edition. A John Wiley&Sons, Ltd., Publication, USA. **KOZAČINSKI L., V. DOBRANIĆ, I. FILIPOVIĆ, N. ZDOLEC, B. NJARI, Ž. CVRTILA FLECK, B. MIOKOVIĆ (2015):** Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG. **MEAD, G.C.** (2004): Poultry meat processing and quality. CRC Press. USA. **NINIOS, T., J. LUNDEN, H. KORKEALA, M. FREDRIKSSON-AHOMA** (2014): Meat inspection and control in the slaughterhouse. Wiley Blackwell. USA. **RAY, B., A. BHUNIA** (2014): Fundamental Food Microbiology. 5th edition. CRC Taylor & Francis, USA. **SUTHERLAND J. P., A. H. VARNAM, M. G. EVANS** (1986): A colour Atlas of food quality control. A Wolfe Science Book. **ZDOLEC, N.** (2017): Fermented Meat Products: Health Aspects. CRC Taylor & Francis, USA.
Optional literature	REGULATION (EC) No 178/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety REGULATION (EC) No 852/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the hygiene of foodstuffs REGULATION (EC) No 853/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL laying down specific hygiene rules of food of animal origin REGULATION (EU) 2017/625 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products

OBJECTIVES AND LEARNING OUTCOMES

Course objectives	In addition to the general aim and tasks, the education of future Doctor of Veterinary Medicine has a special aim. It is the task of lecturers to teach the students how to perform independently all expert activities, and to apply the scientifically verified standards of hygiene and technology within the

	frameworks of the veterinary inspection and evaluation of food safety and quality. Of course, this is possible only by means of education in the field of application of process methods (technology) in the production of food products of high quality and hygiene standards, all in the context of improvement of veterinary public health.
Learning outcomes	By the completion of the course students should be able to: - explain the structure, purpose and methods of veterinary inspection, control and monitoring of production, processing and distribution of food of animal origin - identify hazards and risks in the production and distribution of food of animal origin - interpret the results of food quality assessment and food safety - distinguish the type of food according to the production process - define acceptability factors of food for human consumption - incorporate legislation in the preparation and analysis reports in the field of hygiene and technology of food of animal origin - evaluate production hygiene procedures in the facility and process control indicators

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GRADING SCHEME

Points	*Grade*
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:

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