

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

Organisational unit: Hygiene, Technology and Food Safety

E-mail of the course leader: nzdolec@vef.hr

Register No of the organisational unit:

Zagreb, 01/09/2025

|                                                                                     |                     |            |
|-------------------------------------------------------------------------------------|---------------------|------------|
|  |                     |            |
| 206940                                                                              | REPUBLIKA HRVATSKA  |            |
| Veterinarski fakultet u Zagrebu                                                     |                     |            |
| Primljeno:                                                                          | 03.09.2025          |            |
| Klasifikacijska oznaka                                                              | Org. jed.           |            |
| 602-04/25-22/34                                                                     | 251-61-41/251-61-32 |            |
| Uredbeni broj                                                                       | Prilozi             | Vrijednost |
| 251-61-17-25-27                                                                     | 0                   | -          |

## COURSE SYLLABUS

Course name: Food Hygiene and Technology

Academic year 2025/2026

Course leader: Full Prof. Nevijo Zdolec

Deputy course leader: Full Prof. Željka Cvrtila

Teachers: Full Prof. Željka Cvrtila, Full Prof. Nevijo Zdolec, Assist. Prof. Tomislav Mikuš, teaching assistant Marta Kiš, PhD, teaching assistant Mladenka Vukšić, DVM

First day of classes: 30/09/2025

Last day of classes: 14/01/2026

| Activities - Food Hygiene and Technology (1/5) |       |       |                             |                                            |                  |      |        |                       |                      |
|------------------------------------------------|-------|-------|-----------------------------|--------------------------------------------|------------------|------|--------|-----------------------|----------------------|
| Start Dat                                      | Start | End   | Subject                     | Subject                                    | Group            | Note | Length | Instructor            | Room                 |
| 30/09/2025                                     | 10:00 | 11:30 | Food Hygiene and Technology | p1 Introduction to VPH                     | 9E-1, 9E-2, 9E-3 |      | 1:30   | Mikuš T.              | P_farmakologija      |
| 01/10/2025                                     | 8:15  | 9:45  | Food Hygiene and Technology | p2 Food Microbiology                       | 9E-1, 9E-2, 9E-3 |      | 1:30   | Zdolec N.             | P_mikrobiologija     |
| 02/10/2025                                     | 8:15  | 9:45  | Food Hygiene and Technology | p3 Alimentary infections and intoxications | 9E-1, 9E-2, 9E-3 |      | 1:30   | Zdolec N.             | P_mikrobiologija     |
| 02/10/2025                                     | 10:00 | 11:30 | Food Hygiene and Technology | v1 Food sampling, sensorial analysis       | 9E-2b, 9E-3      |      | 1:30   | Cvrtila Ž., Mikuš T.  | V_higijena namirnica |
| 02/10/2025                                     | 11:45 | 13:15 | Food Hygiene and Technology | v1 Food sampling, sensorial analysis       | 9E-1, 9E-2a      |      | 1:30   | Cvrtila Ž., Vukšić M. | V_higijena namirnica |
| 03/10/2025                                     | 11:15 | 14:15 | Food Hygiene and Technology | v2 Food microbiology                       | 9E-2b, 9E-3      |      | 3:00   | Kiš M., Zdolec N.     | V_higijena namirnica |
| 08/10/2025                                     | 8:00  | 11:00 | Food Hygiene and Technology | v2 Food microbiology                       | 9E-1, 9E-2a      |      | 3:00   | Vukšić M., Zdolec N.  | V_higijena namirnica |
| 09/10/2025                                     | 10:30 | 12:00 | Food Hygiene and Technology | p4 Meat biochemistry                       | 9E-1, 9E-2, 9E-3 |      | 1:30   | Cvrtila Ž.            | P_mikrobiologija     |
| 10/10/2025                                     | 12:15 | 14:30 | Food Hygiene and Technology | v3 Microbiological cleanliness             | 9E-2b, 9E-3      |      | 2:15   | Vukšić M., Zdolec N.  | V_higijena namirnica |
| 13/10/2025                                     | 11:15 | 13:30 | Food Hygiene and Technology | v3 Microbiological cleanliness             | 9E-1, 9E-2a      |      | 2:15   | Kiš M., Zdolec N.     | V_higijena namirnica |
| 14/10/2025                                     | 8:15  | 9:45  | Food Hygiene and Technology | p5 Animal welfare at slaughter             | 9E-1, 9E-2, 9E-3 |      | 1:30   | Mikuš T.              | P_fiziologija        |
| 21/10/2025                                     | 12:15 | 14:30 | Food Hygiene and Technology | v5 Microbiological constructional          | 9E-1, 9E-2a      |      | 2:15   | Kiš M., Zdolec N.     | V_higijena namirnica |

### Activities - Food Hygiene and Technology (2/5)

| Start Dat  | Start | End   | Subject                     | Subject                                                       | Group            | Note | Length | Instructor           | Room                 |
|------------|-------|-------|-----------------------------|---------------------------------------------------------------|------------------|------|--------|----------------------|----------------------|
| 24/10/2025 | 12:15 | 14:30 | Food Hygiene and Technology | v5 Microbiological constructional                             | 9E-2b, 9E-3      |      | 2:15   | Kiš M., Zdolec N.    | V_higijena namirnica |
| 28/10/2025 | 10:30 | 12:45 | Food Hygiene and Technology | v4 AM and PM examination-constructional practicals            | 9E-2b, 9E-3      |      | 2:15   | Kiš M., Mikuš T.     | V_higijena namirnica |
| 28/10/2025 | 13:00 | 15:15 | Food Hygiene and Technology | v4 AM and PM examination-constructional practicals            | 9E-1, 9E-2a      |      | 2:15   | Kiš M., Mikuš T.     | V_higijena namirnica |
| 29/10/2025 | 8:15  | 9:45  | Food Hygiene and Technology | p6 Slaughter processing of ungulates                          | 9E-1, 9E-2, 9E-3 |      | 1:30   | Zdolec N.            | P_mikrobiologija     |
| 03/11/2025 | 12:00 | 14:15 | Food Hygiene and Technology | v6 Water holding capacity; pigments+constructional practicals | 9E-1, 9E-2a      |      | 2:15   | Cvrtila Ž., Mikuš T. | V_higijena namirnica |
| 05/11/2025 | 8:15  | 10:30 | Food Hygiene and Technology | v6 Water holding capacity; pigments+constructional practicals | 9E-2b, 9E-3      |      | 2:15   | Cvrtila Ž., Mikuš T. | V_higijena namirnica |
| 06/11/2025 | 11:15 | 12:45 | Food Hygiene and Technology | p7 Slaughter processing of poultry and game                   | 9E-1, 9E-2, 9E-3 |      | 1:30   | Mikuš T.             | P_fizika             |
| 07/11/2025 | 12:30 | 14:00 | Food Hygiene and Technology | p8 Meat inspection                                            | 9E-1, 9E-2, 9E-3 |      | 1:30   | Zdolec N.            | P_mikrobiologija     |
| 12/11/2025 | 8:15  | 9:45  | Food Hygiene and Technology | p9 Risk-based meat inspection                                 | 9E-1, 9E-2, 9E-3 |      | 1:30   | Zdolec N.            | P_mikrobiologija     |

### Activities - Food Hygiene and Technology (3/5)

| Start Dat  | Start | End   | Subject                     | Subject                                                      | Group            | Note | Length | Instructor            | Room                 |
|------------|-------|-------|-----------------------------|--------------------------------------------------------------|------------------|------|--------|-----------------------|----------------------|
| 12/11/2025 | 10:00 | 12:15 | Food Hygiene and Technology | v7 Meat freshness                                            | 9E-2b, 9E-3      |      | 2:15   | Cvrtila Ž., Mikuš T.  | V_higijena namirnica |
| 13/11/2025 | 9:00  | 11:15 | Food Hygiene and Technology | v7 Meat freshness                                            | 9E-1, 9E-2a      |      | 2:15   | Cvrtila Ž., Mikuš T.  | V_higijena namirnica |
| 13/11/2025 | 11:30 | 13:00 | Food Hygiene and Technology | p10 Meat assessment                                          | 9E-1, 9E-2, 9E-3 |      | 1:30   | Zdolec N.             | P_mikrobiologija     |
| 20/11/2025 | 8:15  | 13:30 | Food Hygiene and Technology | t01 Field course slaughterhouse                              | 9E-1, 9E-2, 9E-3 |      | 5:15   | Vukšić M., Zdolec N.  |                      |
| 25/11/2025 | 8:15  | 9:45  | Food Hygiene and Technology | p11 Meat quality; Conservation                               | 9E-1, 9E-2, 9E-3 |      | 1:30   | Cvrtila Ž.            | P_mikrobiologija     |
| 26/11/2025 | 14:00 | 15:30 | Food Hygiene and Technology | v8 Fat quality; minced meat                                  | 9E-2b, 9E-3      |      | 1:30   | Cvrtila Ž., Mikuš T.  | V_higijena namirnica |
| 27/11/2025 | 14:00 | 15:30 | Food Hygiene and Technology | v8 Fat quality; minced meat                                  | 9E-1, 9E-2a      |      | 1:30   | Cvrtila Ž., Mikuš T.  | V_higijena namirnica |
| 05/12/2025 | 10:00 | 11:30 | Food Hygiene and Technology | p12 Carcass cutting and carcass quality                      | 9E-1, 9E-2, 9E-3 |      | 1:30   | Mikuš T.              | P_fizika             |
| 05/12/2025 | 11:45 | 13:15 | Food Hygiene and Technology | v9 Aditions, spices, minced meat - constructional practicals | 9E-2b, 9E-3      |      | 1:30   | Cvrtila Ž., Vukšić M. | V_higijena namirnica |

### Activities - Food Hygiene and Technology (4/5)

| Start Dat  | Start | End   | Subject                     | Subject                                                       | Group            | Note | Length | Instructor                      | Room                 |
|------------|-------|-------|-----------------------------|---------------------------------------------------------------|------------------|------|--------|---------------------------------|----------------------|
| 05/12/2025 | 13:30 | 15:00 | Food Hygiene and Technology | v9 Aditives, spices, minced meat - constructional practicals  | 9E-1, 9E-2a      |      | 1:30   | Cvrtila Ž., Vukšić M.           | V_higijena namirnica |
| 09/12/2025 | 8:15  | 13:30 | Food Hygiene and Technology | t02 Field course slaughterhouse                               | 9E-1, 9E-2, 9E-3 |      | 5:15   | Kiš M., Zdolec N.               |                      |
| 11/12/2025 | 10:00 | 11:30 | Food Hygiene and Technology | p13 Additives; Meat processing                                | 9E-1, 9E-2, 9E-3 |      | 1:30   | Cvrtila Ž.                      | P_fiziologija        |
| 11/12/2025 | 12:00 | 13:30 | Food Hygiene and Technology | p14 Thermally treated meat products                           | 9E-1, 9E-2, 9E-3 |      | 1:30   | Mikuš T.                        | P_fiziologija        |
| 12/12/2025 | 8:30  | 11:30 | Food Hygiene and Technology | v10 Thermally treated meat products+constructional practicals | 9E-1, 9E-2a      |      | 3:00   | Cvrtila Ž., Mikuš T., Zdolec N. | V_higijena namirnica |
| 12/12/2025 | 12:00 | 15:00 | Food Hygiene and Technology | v10 Thermally treated meat products+constructional practicals | 9E-2b, 9E-3      |      | 3:00   | Cvrtila Ž., Mikuš T., Zdolec N. | V_higijena namirnica |
| 16/12/2025 | 8:15  | 13:30 | Food Hygiene and Technology | t03 Field course slaughterhouse                               | 9E-1, 9E-2, 9E-3 |      | 5:15   | Kiš M., Mikuš T.                |                      |
| 18/12/2025 | 11:15 | 12:45 | Food Hygiene and Technology | p15 Thermally non treated meat products                       | 9E-1, 9E-2, 9E-3 |      | 1:30   | Cvrtila Ž.                      | P_mikrobiologija     |

### Activities - Food Hygiene and Technology (5/5)

| Start Dat  | Start | End   | Subject                     | Subject                                                          | Group       | Note | Length | Instructor         | Room                 |
|------------|-------|-------|-----------------------------|------------------------------------------------------------------|-------------|------|--------|--------------------|----------------------|
| 22/12/2025 | 8:15  | 10:30 | Food Hygiene and Technology | v9 Thermally non-treated meat products+constructional practicals | 9E-1, 9E-2a |      | 2:15   | Cvrtila Ž., Kiš M. | V_higijena namirnica |
| 22/12/2025 | 11:00 | 13:15 | Food Hygiene and Technology | v9 Thermally non-treated meat products+constructional practicals | 9E-2b, 9E-3 |      | 2:15   | Cvrtila Ž., Kiš M. | V_higijena namirnica |
| 07/01/2026 | 10:15 | 12:30 | Food Hygiene and Technology | v11 Meat inspection-necropsy hall                                | 9E-1, 9E-2a |      | 2:15   | Vukšić M.          | S_patologija         |
| 07/01/2026 | 13:00 | 15:15 | Food Hygiene and Technology | v11 Meat inspection-necropsy hall                                | 9E-2b, 9E-3 |      | 2:15   | Zdolec N.          | S_patologija         |
| 13/01/2026 | 12:00 | 15:00 | Food Hygiene and Technology | v12 Meat inspection-necropsy hall                                | 9E-1, 9E-2a |      | 3:00   | Kiš M.             | V_higijena namirnica |
| 14/01/2026 | 8:00  | 11:00 | Food Hygiene and Technology | v12 Meat inspection-necropsy hall                                | 9E-2b, 9E-3 |      | 3:00   | Zdolec N.          | V_higijena namirnica |
| Total: 44  |       |       |                             |                                                                  |             |      | 96:45  |                    |                      |

### 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 (15 h in IX. semester and 15 h in X. semester). 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 73 hours of exercises (42 h in IX. Semester and 31 h in X. semester). 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. <b>Article 41:</b> a student can justifiably be absent from up to 50 % of the lectures and 30 % of the exercises.                                    |

### **GRADING AND EVALUATING STUDENT WORK**

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Continuous knowledge-checking (mid-terms) | <p>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.</p> <p>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).</p> |
| Final exams (dates)                       | 13/11/2025, 12/12/2025, 28/1/2026, 16/2/2026                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Form of final exam                        | Oral exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## LITERATURE

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Obligatory literature | <p><b>KOZAČINSKI et al.</b> (2021): Handbook of laboratory practicals in Food Hygiene and Technology. Faculty of Veterinary Medicine, UNIZG. In press.</p> <p><b>NINIOS, N., J. LUNDEN, H. KORKEALA, M. FREDRIKSSON-AHOMA</b> (2014): Meat inspection and control in the slaughterhouse. Wiley Blackwell.</p> <p><b>D.S. COLLINS, R. J. HUEY</b> (2015): Gracey's Meat hygiene. 11th edition. A John Wiley &amp; Sons, Ltd., Publication, 2015.</p> <p><b>RAY, B., A. BHUNIA</b> (2014): Fundamental Food Microbiology. 5th edition. CRC Taylor &amp; Francis, USA.</p> <p><b>BORDA. D., A. I. NICOLAU, P. RASPOR</b> (2018): Trends in Fish Processing Technologies. CRC Taylor &amp; Francis, USA.</p> <p><b>CHANDAN, C.R., A. KILARA, N. P. SHAH</b> (2008): Dairy Processing &amp; Quality Assurance. A John Wiley &amp; Sons, Ltd., Publication, 2008.</p> <p><b>MEAD, G.C.</b> (2004): Poultry meat processing and quality. CRC Press. 2004.</p> <p><b>SUTHERLAND J. P., A. H. VARNAM, M. G. EVANS</b> (1986): A colour Atlas of food quality control. A Wolfe Science Book.</p> <p><b>ZDOLEC, N.</b> (2017): Fermented Meat Products: Health Aspects. CRC Taylor &amp; Francis, USA.</p> |
| Optional literature   | <p>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</p> <p>REGULATION (EC) No 852/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the hygiene of foodstuffs</p> <p>REGULATION (EC) No 853/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL laying down specific hygiene rules of food of animal origin</p> <p>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</p>                                                                                                                                                                                                                                                                                                                                                                                                     |

### **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: <ul style="list-style-type: none"><li>- distinguish the structure, purpose and methods of veterinary inspection in the production of food of animal origin</li><li>- rank the hazards and risks involved in the production and of food of animal origin</li><li>- evaluate the results of the food hygiene and quality control assessment</li><li>- distinguish the type of food according to the production process</li><li>-determine the factors for the acceptability of foods for human consumption</li><li>-interpret legislation for the needs of participation in the preparation and analysis of reports in the field of hygiene</li><li>-review production hygiene procedures in the facility and process control indicators</li></ul> |

### 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:



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

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