DOCTORAL STUDY
IN
VETERINARY SCIENCES
1. Introduction

1.1 Reasons for Initiating Doctoral Studies

a) In assessing the purpose for initiating new doctoral studies at the Faculty of Veterinary Medicine, University of Zagreb, it is worthwhile to consider the fact that ninety-nine candidates have earned doctorates during the past ten years on the basis of the doctoral studies organized to date. Of this number, thirty-seven (37.3%) are employees of the Faculty of Veterinary Medicine, while sixty-two (62.7%) are employed by other scientific institutions or economic subjects (Table 1). It is evident that there is significant interest in doctoral studies among persons outside the Faculty, from other scientific institutions in Croatia or economic subjects, who wish to expand their operations and employ competent scientists in their laboratories. Moreover, in keeping with the scientific research and technological development of the country, the studies shall contribute to the development of persons trained to work in the research programs of small and medium-sized enterprises, especially within the framework of the national strategic priorities of agricultural production and the providing of quality and wholesome food.

Table 1. The total number of doctorates earned at the Faculty of Veterinary Medicine, University of Zagreb, 1993–2003, in comparison to the number of doctorates earned by employees of the Faculty of Veterinary Medicine during the same period.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of doctorates</th>
<th>Number of doctorates earned by Faculty employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>1994</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>1995</td>
<td>5</td>
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<td>1997</td>
<td>11</td>
<td>2</td>
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<tr>
<td>1998</td>
<td>9</td>
<td>4</td>
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<tr>
<td>1999</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>2000</td>
<td>7</td>
<td>4</td>
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<td>2001</td>
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<tr>
<td>2002</td>
<td>4</td>
<td>1</td>
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<tr>
<td>2003</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>99</td>
<td>37</td>
</tr>
</tbody>
</table>

b) Student education shall take place within the framework of the realization of the program of scientific projects, which is being pursued by the instructors and scientists of the Faculty. At the Faculty, scientific work is currently in progress on over fifty scientific and technological projects financed by domestic subjects and eight projects financed by foreign institutions or the private sector.

c) Research cooperation has been established on specific international projects, either on the basis of individual cooperation by Faculty employees with scientists from other countries or at the level of institutional cooperation on the basis of bilateral contracts signed between the Veterinary Faculty, University of Zagreb, and schools of veterinary medicine in Brno, Ljubljana and Sarajevo. A special aspect of cooperation has been established with the Veterinary University in Vienna, where many Faculty employees have pursued advanced studies. With the Veterinary University in Vienna, a joint TEMPUS project has been proposed for the reorganization of the entire scientific teaching activities at the Faculty.

d) The new plan proposal for doctoral studies at the Faculty of Veterinary Medicine in Zagreb was presented to the deans of veterinary schools assembled at the VetNEST 2004 Assembly (deans of
veterinary schools in Vienna, Brno, Budapest, Košice, Ljubljana, Wroclaw and Zagreb), who are open to cooperation and the future coordination of the program.

1.2. Experience to Date in Conducting Postgraduate Doctoral Studies and Master’s Scientific Studies at the Faculty of Veterinary Medicine, University of Zagreb

Since the founding of the Faculty of Veterinary Medicine, University of Zagreb, in the year 1919, organized scientific activity has been conducted, with particular attention devoted to the training of rising generations of scientists. In this sense, the Faculty has many years of experience in the organization and conducting of postgraduate scientific and specialist studies. The first postgraduate program was organized in the 1961/1962 academic year in Hygiene and the Technology of Foodstuffs of Animal Origin. It was later joined by other studies and continued to be held under these initial programs until the 1987/1988 academic year. That year, there was a reorganization of the postgraduate studies. Programs that were new in terms of concept and content were issued, according to which postgraduate instruction was conducted until the 1993/1994 academic year. With the passage of the Institutions of Higher Education Act and the Scientific Research Act (Narodne novine [Official Gazette of the Republic of Croatia], No. 96/1993), a new approach to postgraduate instruction was determined so that new programs were issued in the 1995/1996 academic year for postgraduate scientific studies organized as two years of studies for earning a master of science and three years of studies for earning a doctorate. In the year 1999, they were accepted by the National Council for Higher Education. Up to the present time, instruction has been conducted according to courses of study. A total of 14 courses of study were organized in the scientific studies. That same year, postgraduate specialist programs for advanced studies and earning a master’s degree were also organized. The sudden influx of scientific knowledge and new approaches in education require their reorganization, which should be performed pursuant to the Scientific Activity and Higher Education Act (Narodne novine [Official Gazette of the Republic of Croatia], No. 123/2003).

New postgraduate studies were developed, after taking into account this Act and the observations made by a group of professional experts from the European Association of Establishments for Veterinary Education (EAEVE: Report on the Visit to the Veterinary Faculty of Zagreb, 7–13 October 2002, pp. 67–68, issued in 2003), in which it is stated that postgraduate instruction at our Faculty is splintered in many directions and lacks the necessary coordination, which leads to the unsuitable utilization of scientific equipment and deficiencies in the education of students.

Moreover, the opinion of the National Commission for the Evaluation of Educational Institutions, appointed by the Ministry of Science and Technology of the Republic of Croatia, that prepared an evaluation of the quality of the instruction and visited the Faculty from December 17 to 19, 2003, should also be taken into account. This commission was of the opinion that the programs of our postgraduate studies often overlap in content and that some parts are even identical in content to the undergraduate studies.

On the basis of the presented facts, the new program of postgraduate doctoral studies was prepared, which shall be more geared to the interests of students and the needs of employers, and has been organized according to the European Credit Transfer System (ECTS).

1.3. Openness of Studies According to Student Mobility

Since this new program is no longer organized according to courses of study, by which student mobility was hindered or even limited according to institutional affiliation or the organizational units of the Faculty, there is significantly greater student mobility in the choice of subjects, the content of which an individual student would be interested in pursuant to the topic of his or her doctoral dissertation. Besides this internal mobility, a student shall be able to obtain a certain number of ECTS points by attending the necessary courses at some other cooperating veterinary institution of higher education.

1.4. Opportunity for Inclusion in Joint Study Programs with Foreign Universities

At the level of European schools of veterinary medicine, the need has been demonstrated for joint programs of doctoral studies (Journal of Veterinary Medical Education, 2004). Within the framework of the above-mentioned cooperation with various schools of veterinary medicine in Europe, perspectives will open for cooperation on joint doctoral programs in the future.
2. GENERAL INFORMATION

2.1. Name of studies: DOCTORAL STUDIES IN VETERINARY SCIENCE
   Area: Biomedicine and Health
   Field: Veterinary Medicine

2.2. Primary Educational Institution: Faculty of Veterinary Medicine, University of Zagreb
    Cooperating Institution: Croatian Veterinary Institute

2.3. Institutional Strategy for the Development of Doctoral Studies
   The program proposed for doctoral studies shall be developed pursuant to the existing scientific
   potential of the Faculty, the demonstrated interests of students and the needs of employees, with precisely
   described competencies and tasks that the candidates shall be able perform after the completion of their
   studies, i.e. after passing the examination in a particular subject. The content of the subjects shall be
   constantly modernized and mutually coordinated, as necessary, so that there shall be no repetition of
   content from undergraduate instruction. A joint central system shall be organized for conducting the entire
   instructional program as well as controlling the quality of its implementation. To the extent possible,
   instruction should be based upon the practical work by students in mastering the relevant and newest
   scientific procedures. From the first year of studies, students should be included in work on scientific
   projects and continuously follow scientific literature in order to develop a personal critical attitude toward
   their own results and ideas. Moreover, students should be able to take student trips to foreign scientific
   institutions in order to master specific procedures and skills.

2.4. Innovativeness of the Program
   The innovativeness of the program lies in a completely new approach that fosters maximum
   creativity by the students in forming their own programs of studies on the basis of the subjects offered and
   greater freedom and engagement to devote themselves to studies of such contents that shall be in keeping
   with the topics of their dissertations or general scientific interests. Thereby, students shall be able to
   develop into top experts in leading the scientific process in their particular scientific disciplines. The
   interdisciplinary nature of the study is reflected in the large number of subjects offered from various
   scientific disciplines. In this sense, it is well to remember the fact that the area of veterinary medicine is
   very broad and encompasses various species of animals, from fish, reptiles and birds to mammals, and
   various production processes in connection with this.
   The inclusion of scientists from other scientific institutions (Ruder Bošković Institute, the Croatian
   Veterinary Institute) in the realization of the proposed program also fosters the development of
   collaboration in the solving of given scientific problems.

2.5. Prerequisites for Enrollment
   Prerequisites for Enrollment in the First Year of Studies
   Students are permitted to enroll in the studies who have completed undergraduate studies at one of
   the faculties of the biomedical group, i.e. candidates who have earned the academic title of doctor of
   veterinary medicine, doctor of medicine, doctor of stomatology or master of pharmacy. Moreover,
   candidates shall also be permitted to enroll who have completed undergraduate studies at faculties of
   agronomy, food-biotechnology and natural sciences/mathematics. Students shall be permitted to enroll in
   subjects in the area of hunting who have completed the faculty of forestry.
   Students of other postgraduate studies shall also be permitted to enroll in individual subjects, with
   the permission of the head of the study or subject. Students shall be permitted to enroll in the clinical
   subjects in internal diseases, obstetrics and reproductive medicine who have completed the faculty of
   veterinary medicine or another faculty from the area of biomedicine and health. Only students who have
   completed the faculties of veterinary medicine, medicine or stomatology shall be permitted to enroll in the
   subjects of the surgical group.
When enrolling in studies, a student shall be required to enclose written consent from the potential mentor.

**Prerequisites for the Enrollment of Students Who Have Acquired Previous Qualifications**

Persons who have acquired previous qualifications shall be permitted to complete doctoral studies with the preparation of a doctoral dissertation according to Article 120 of the Scientific Activities and Higher Education Act (*Narodne novine* [Official Gazette of the Republic of Croatia], No. 123/2003) or enroll in two semesters of doctoral studies in which they shall obtain at least sixty additional ECTS points, including the writing of the dissertation.

Students who have completed professional postgraduate studies shall be permitted to enroll in doctoral studies under the condition that they attend and pass various methodological subjects from the first semester of doctoral studies, amounting to a minimum of thirty points. From the group of branch-oriented subjects, they shall also be required to acquire a minimum of thirty points and sixty points for the preparation of the doctoral dissertation, in which points from the third point groups shall also be included.

In exceptional cases, students who have completed professional studies shall be permitted to choose to prepare a doctoral dissertation under the condition that they first have a minimum of three scientific works published in journals indexed in CC or SCI that are related to the topic of their doctoral dissertation. In one of the three articles, the student must be the first author.

When enrolling in additional semesters, a student shall be required to submit the written consent of the potential mentor.

Pursuant to Article 73, Item 4 of the Scientific Activities and Higher Education Act (*Narodne novine* [Official Gazette of the Republic of Croatia], No. 123/2003), applicants who have made scientific achievements that in terms of their significance meet the requirements for selection in a scientific profession shall be permitted to earn a doctorate through enrollment in doctoral studies and the preparation of a doctoral dissertation without attending lectures or taking examinations. The conditions for this means of earning a doctorate shall be stipulated by the Regulations on Doctoral Studies.

**The Conditions for the Enrollment of Students Who Have not Graduated from the Faculty of Veterinary Medicine or a Related Faculty**

Applicants who did not graduate from the Faculty of Veterinary Medicine or a related faculty shall be permitted to enroll in the doctoral studies with special recommendations from three competent instructors at the Faculty and after passing examinations in subjects that shall be determined by a commission appointed by the faculty council.

**2.6. Criteria and Procedure for Selecting Applicants**

In the selection of students for doctoral studies, the following criteria shall be taken into account:

a) a minimum grade average of 3.51 during undergraduate studies

b) demonstrated interest in scientific work during undergraduate studies, for example, the preparation of a student project nominated for the Rector’s Award, participation in work on scientific projects, presentation of work at domestic and foreign scientific meetings etc.

c) written expression of interest for the enrollment of a specific candidate with a description of the traits that characterize the candidate as a potentially good scientist

d) certificate from a relevant institution on the candidate’s knowledge of the English language at the level necessary for following scientific and professional literature and the ability to communicate normally in the scientific community

e) familiarity with the use of computers

**2.7. Competencies that a Student Acquires with the Completion of Studies, Opportunities for the Continuation of Scientific Research Work, Opportunities for Postdoctoral Studies, and Opportunities for Employment in the Public and Private Sectors**

With the completion of the studies, the student shall be competent to participate in work on scientific projects, following scientific literature in his or her field, write scientific articles, communicate with the scientific community in the world, propose or participate in the proposal of new scientific projects,
participate in university scientific processes etc. The student shall be qualified to pursue further postdoctoral studies at scientific research institutions throughout the world and shall be able to participate in the work of public and private research institutions.
3. PROGRAM DESCRIPTION

3.1. The Structure and Organization of Doctoral Studies

The basic definition of these doctoral studies is a scientific program of instruction from the broad area of veterinary sciences and adaptability based upon individual doctoral dissertations. The studies encompass three point groups. Two point groups are methodological (Group I) and branch-oriented (Group II) subjects, and the third point group encompasses student scientific activity.

**Point Group I.** This group shall consist of general required and elective subjects that are the framework of the entire studies. These are the fundamental methodological subjects of the biomedical sciences and subjects that comprise the basis of scientific work. They provide students with basic knowledge on how to approach scientific work and how to master the basic principles necessary for conducting a scientific process. Due to the large number of various scientific methods, a student of a specific methodological subject for an individual area shall be permitted to chose among the group of branch-oriented subjects. Through such subjects, students shall acquire the necessary knowledge from laboratory work. In the point values required for proposing a topic for a doctoral dissertation, the subjects from this group participate with a minimum of thirty points. A student is required to collect twenty-five points from the group of required methodological subjects and five points from the group of elective subjects.

**Point Group II.** This group shall be comprised of branch-oriented elective subjects. They qualify a student for the theoretical understanding of scientific problems of a specific narrow area (branch) and direct him toward creativity in scientific work. The wide range of elective branch-oriented subjects shall provide a student with the opportunity to acquire the specific knowledge pursuant to his scientific interest and chosen topic for his doctoral dissertation. These subjects shall make it possible for students to enter more deeply into scientific problems in specific narrow scientific branches and provide a practical basis for the successful realization of a dissertation topic in a particular scientific area. Since students cannot master numerous scientific methods within the framework of the methodological subjects, they shall be permitted to chose subjects from this group that make it possible for them to master specific research methods. In consultation with a student’s mentor, the student shall choose which subjects from these point groups he will enroll in. In this group there shall be over one hundred seventy elective subjects offered, each of which carries a specific number of ECTS points. A student shall take the subjects from this group during the second, third and fourth semesters. Moreover, this group also includes subjects from the fund of organized specialized studies, that shall also be available to all those who are pursuing studies, and can be chosen depending on the affinities and needs of the individual student.

**Point Group III.** The third point group shall include the scientific activities of students during their studies, and refers to the publication of scientific articles in relevant scientific journals and student participation with papers at international and domestic scientific meetings. See Item 3.3.

3.2. List of the Required and Elective Subjects with the Number of Course Hours and ECTS Points

<table>
<thead>
<tr>
<th>Prva bodovna skupina: metodološki predmeti</th>
<th>First credit group: methodological courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Naziv predmeta (voditelj)</strong></td>
<td><strong>Course name (co-operator)</strong></td>
</tr>
<tr>
<td><strong>Fond sati</strong></td>
<td><strong>Course load in hours</strong></td>
</tr>
<tr>
<td><strong>Sati ukupno</strong></td>
<td><strong>Total hours</strong></td>
</tr>
<tr>
<td><strong>Broj bodoava</strong></td>
<td><strong>Credits</strong></td>
</tr>
<tr>
<td>Predavanja</td>
<td>Lectures</td>
</tr>
<tr>
<td>Course Name (Co-operator)</td>
<td>Lectures</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Method of scientific and research work (Željko Grabarević, Frane Božić)</td>
<td>16</td>
</tr>
<tr>
<td>Ethics and welfare in the veterinary medicine experimental work (Marija Vučenilo)</td>
<td>15</td>
</tr>
<tr>
<td>Statistical methods in veterinary research (Velimir Sušić)</td>
<td>6</td>
</tr>
<tr>
<td>Informatics in biomedicine (Ivica Harapin)</td>
<td>3</td>
</tr>
<tr>
<td>Enzyme complexes in cellular metabolism (Tihana Žanić Grubišić)</td>
<td>14</td>
</tr>
<tr>
<td>Comparative biochemistry (Mira Grdiša)</td>
<td>14</td>
</tr>
<tr>
<td>Functional aspects of genetical and biochemical events in normal and tumor cell (Mira Grdiša, Sonja Levanat)</td>
<td>16</td>
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<tr>
<td>Methods of molecular biology in veterinary medicine (Mira Grdiša)</td>
<td>12</td>
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</tbody>
</table>
| 9. | Ekološki odnosi i veterinarska djelatnost  
*Ecological relations and field of veterinary work*  
*(Duro Huber)* | 10 | 5 | 8 | 23 | 2,0 |
| 10. | Veterinarska epidemiologija  
*Veterinary epidemiology*  
*(Miroslav Benić, Željko Mihaljević)* | 10 | 5 | 5 | 20 | 2,0 |
| 11. | Molekularna biologija u veteriniji  
*Molecular biology in veterinary*  
*(Ivica Valpotić, Maja Popović)* | 15 | 5 | 10 | 30 | 2,5 |
| 12. | Stanična i razvojna biologija  
*Cellular and Developmental Biology*  
*(Ivica Valpotić, Maja Popović)* | 15 | 5 | 10 | 30 | 2,5 |
| 13. | Pokusne životinje i pokusni modeli u biomedicinskim istraživanjima  
*Laboratory animals and animal models used in biomedical research programs*  
*(Marko Radačić)* | 20 | 5 | 5 | 30 | 3,0 |
| 14. | Biokemijsko-biološka analitika u veterinarskoj medicini  
*Biochemical and biological analytics in veterinary medicine*  
*(Željka Cvrtila Fleck)* | 5 | 5 | 10 | 20 | 1,5 |

**Druga bodovna skupina: granski usmjereni predmeti**  
*Second credit group: field related courses*

| Naziv predmeta (voditelj)  
Course name (co-operator) | Fond sati  
Course load in hours | Sati ukupno  
Total hours | Broj bodova  
Credits |
|---|---|---|---|
| Predavanja  
Lectures | Seminari  
Seminars | Vježbe  
Practicals | |
| 1. Funkcionalna morfologija peradi i pernate divljači  
*Functional morphology of poultry and game birds*  
*(Vesna Gjurčević Kantura)* | 10 | 5 | 15 | 30 | 4,5 |
| 2. Histološki, histokemijski i morfometrijski postupci u biomedicinskim znanostima  
*Histological, histocemimac and morphometric procedures in biomedical sciences*  
*(Zvonimir Kozarić, Snježana Kužir)* | 8 | 2 | 10 | 20 | 3,0 |
| 3. | Morfologija, uzgoj i način držanja kaveznih ptica  
*Morphology, breeding and the way of keeping cage birds*  
(*Srebrenka Nejedli*) | 10 | - | 5 | 15 | 2,5 |
| 4. | Anatomija divljači i pernate divljači  
*The anatomy of the game and the feathered game*  
(*Damir Mihelić*) | 15 | - | 30 | 45 | 5,5 |
| 5. | Komparativna grada autopodija za potrebe veterinarske ortopedije  
*Comparative conformation of autopodium for veterinary orthopedic needs*  
(*Vesna Gjurčević Kantura, Tajana Trbojević Vukičević*) | 15 | - | 30 | 45 | 6,0 |
| 6. | Anatomski, histološki i genetski pristup veterinarskoj forenzici  
*Anatomical, histological and genetical approach to veterinary forensics*  
(*Damir Mihelić*) | 15 | - | 30 | 45 | 6,0 |
| 7. | Primijenjena arheozoologija  
*Applied archaeozoology*  
(*Tajana Trbojević Vukičević*) | 15 | - | 30 | 45 | 5,5 |
| 8. | Embriomalne osnove kongenitalnih malformacija u domaćih životinja  
*Developmental principle of congenital malformation in domestic animals*  
(*Snježana Vuković*) | 6 | 6 | - | 12 | 3,5 |
| 9. | Sistematika i evolucija morskih sisavaca  
*Marine mammals systematise and evolution*  
(*Tomislav Gomerčić*) | 10 | 10 | 10 | 30 | 4,0 |
| 10. | Biologija s osnovama fiziologije morskih sisavaca  
*Biology and fundamental physiology of marine mammals*  
(*Tomislav Gomerčić*) | 15 | 10 | 35 | 60 | 6,0 |
| 11. | Anatomija dobrog dupina  
*(Tursiops truncatus)*  
*Anatomy of bottlenose dolphin*  
*(Tursiops truncatus)*  
(*Martina Duras Gomerčić*) | 15 | - | 60 | 75 | 5,5 |
| 12. | Biologija i patologija cetacea u jadranskom moru  
*Cetacean biology and pathology in the adriatic sea*  
(*Hrvoje Lucić, Martina Duras Gomerčić*) | 15 | - | 90 | 105 | 6,0 |
|  | Primijenjene morfološke i molekularne metode u populacijskim istraživanjima morskih sisavaca  
*Applied morphological and molecular methods in population studies of marine mammals*  
*(Ana Galov, Martina Duras Gomerčić)* | 5 | - | 30 | 35 | 4,0 |
|---|---|---|---|---|---|
| 14. | Komparativna morfologija lokomocijskog sustava kralježnjaka  
*Comparative morphology of locomotion system of the vertebrates*  
*(Srebrenka Nejedli, Vesna Gjurčević-Kantura)* | 20 | - | 180 | 200 | 10,0 |
| 15. | Komparativna morfologija utrobnih organa kralježnjaka  
*Comparative morphology of visceral organs of the vertebrates*  
*(Martina Duras Gomerčić, Tajana Trbojević Vukičević)* | 30 | - | 270 | 300 | 10,0 |
| 16. | Komparativna morfologija opticajnog sustava kralježnjaka  
*Comparative morphology of circulatory system of the vertebrates*  
*(Hrvoje Lucić, Vesna Gjurčević-Kantura)* | 10 | - | 90 | 100 | 8,5 |
| 17. | Komparativna morfologija živčanih i osjetilnih organa kralježnjaka  
*Comparative morphology of the nervous system and the sense organs of the vertebrates*  
*(Hrvoje Lucić, Damir Mihelić)* | 10 | - | 90 | 100 | 9,0 |
| 18. | Komparativna morfologija kože i njenih derivata kralježnjaka  
*Comparative morphology of common integument of the vertebrates*  
*(Snježana Kužir, Vesna Gjurčević-Kantura)* | 10 | - | 90 | 100 | 6,5 |
| 19. | Vode u veterinarskoj djelatnosti – kakvoća i obrada  
*Waters in veterinary practice – quality and testing*  
*(Alenka Tofant)* | 9 | 12 | 9 | 30 | 4,0 |
| 20. | Veterinarska djelatnost i zaštita okoliša  
*Veterinary service and environmental protection*  
*(Marija Vućemilo)* | 14 | 8 | 8 | 30 | 4,0 |
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<thead>
<tr>
<th></th>
<th>Title</th>
<th>Authors</th>
<th>Pages</th>
<th>Duration</th>
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</table>
|21.| Higijena zraka u stočnim nastambama<br>
*Air hygiene in stock housing*<br>
(Marija Vučemilo)       |        |       | 14 8 8 30 3.5 |
|22.| Mjere sanitacije u stočarskoj proizvodnji<br>
*Sanitation measures in stock production*<br>
(Marija Vučemilo)       |        |       | 14 8 8 30 3.5 |
|23.| Veterinarska djelatnost u projektiranju staja<br>
*Veterinary activities in stable projecting*<br>
(Željko Pavičić)        |        |       | 14 8 8 30 4.0 |
|24.| Ekološka proizvodnja u stočarstvu<br>
*Ecological production in cattle breeding*<br>
(Željko Pavičić)        |        |       | 20 15 20 45 4.5 |
|25.| Odnosi između organizama, okoliša i zdravlja životinja<br>
*Relations between the organisms, the environment and the animal health*<br>
(Željko Pavičić, Marija Vučemilo) |        |       | 15 5 2 22 4.0 |
|26.| Komparativne tehnologije stočarske proizvodnje<br>
*Comparative technologies in livestock industry*<br>
(Marija Vučemilo, Željko Pavičić) |        |       | 14 8 8 30 3.5 |
|27.| Sistematika, biologija, anatomija i fiziologija pčela<br>
*Systematization, anatomy and physiology, ethology and activities of bees*<br>
(Željka Matašin)         |        |       | 60 - 25 85 8.0 |
|28.| Uzgoj pčela, pčelinji proizvodi i apiterapija<br>
*Bee breeding, bee products and apitherapy*<br>
(Željka Matašin)         |        |       | 30 - 15 45 4.5 |
|29.| Epizootiologija, profilaksa i terapija pčelinjih bolesti<br>
*Epizootiology, prophylaxis and treatment of bee diseases*<br>
(Željka Matašin)         |        |       | 50 - 20 70 7.0 |
|30.| Zarazne pčelinje bolesti<br>
*Infectious bee diseases*<br>
(Ivana Tiak Gajger)      |        |       | 110 - 60 170 10.0 |
|31.| Nametničke pčelinje bolesti<br>
*Parasitic bee diseases*<br>
(Željka Matašin)         |        |       | 70 - 30 100 9.0 |
| 32. | Nezarazne bolesti, otrovanja pčela i štetnici  
*Non-infectious bee diseases, poisoning and pests*  
(Ivana Tlak Gajger) | 60 | - | 20 | 80 | 6,5 |
| 33. | Statistika  
*Statistics*  
(Marko Tadić) | 20 | - | 30 | 50 | 5,5 |
| 34. | Analiza rizika u veterinarstvu  
*Veterinary risk analysis*  
(Marina Pavlak) | 10 | 20 | 20 | 50 | 6,0 |
| 35. | Europski veterinarski standardi i propisi  
*European veterinary standards and regulations*  
(Marko Tadić) | 20 | - | - | 20 | 3,0 |
| 36. | Zdravlja životinja i sigurnost hrane u međunarodnoj trgovini  
*Animal health and food safety in international trade*  
(Marko Tadić) | 20 | - | - | 20 | 3,0 |
| 37. | Metode procjene šteta zbog bolesti životinja  
*Animal illness losses assessment methods*  
(Marko Tadić) | 20 | - | 10 | 30 | 4,0 |
| 38. | Programiranje zaštite zdravlja životinja  
*Animal health protection programming*  
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| 135. | Imunoparazitologija  
*Immunoparasitology (Frane Božić)* | 18 | 4 | 8 | 30 | 4,5 |
| 136. | Veterinarska onkologija  
*Veterinary oncology (Željko Grabarević)* | 20 | - | 40 | 60 | 4,0 |
| 137. | Osnove imunohistokemijske tehnike  
*The basics of immunohistochemical methods (Željko Grabarević)* | 10 | - | 20 | 30 | 4,5 |
| 138. | Bolesti na staničnoj razini  
*Disease at the cellular level (Ruža Sabočanec)* | 10 | - | 15 | 25 | 3,5 |
| 139. | Osnove patologije cirkulatornih poremećaja  
*Basic pathology - disturbances of circulation (Ruža Sabočanec)* | 10 | - | 15 | 25 | 3,5 |
| 140. | Priroda i uzroci bolesti – interakcije nosioca, patogena i okoliša  
*Nature and causes of disease-interaction of host, pathogen, and environment (Ruža Sabočanec)* | 10 | - | 15 | 25 | 3,5 |
| 141. | Patogeneza zaraznih i parazitskih bolesti  
*Pathogenesis of the infectious and parasitic diseases (Branka Artuković)* | 6 | 2 | 2 | 10 | 2,5 |
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<td>Patomorfologija bolesti okoliša, toksikoloških i bolesti prehrane</td>
<td>Ruža Sabočanec</td>
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<td>Primjena biokemijskih metoda u kliničkoj praksi</td>
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<td>Praćenje energetskog i tvarnog stanja u mliječnih krava, ovaca i koza</td>
<td>Damir Žubčić</td>
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<td>Veterinarska hematologija i transfuziologija</td>
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| 152. | Bolesti dišnog sustava  
*Respiratory tract disorders*  
(Ljiljana Bedrica) |
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| 153. | Bolesti miokarda i endokarda u pasa i mačaka  
*Myocardial and endocardial diseases of the dogs and the cats*  
(Ljiljana Bedrica) |
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| 154. | Klinička prehrana pasa i mačaka  
*Clinical nutrition of the dog and cat*  
(Ljiljana Bedrica) |
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| 155. | Bolesti gušterača u pasa  
*Diseases of pancreas in dogs*  
(Ivica Harapin) |
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| 156. | Tumori, neinfektivna i nenasljedna stanja i bolesti mlječne žlijezde domaćih mesojeda  
*Tumours, noninfection and nonhereditary conditions and mammary gland diseases of domestic carnivores*  
(Darko Gereš) |
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| 157. | Prevencija i suzbijanje stanja smanjene plodnosti mlječnih krava  
*Prevention and suppression of subfertility condition of dairy cows*  
(Darko Gereš) |
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| 158. | Oboljenja mlječne žlijezde  
*Udder diseases*  
(Marijan Cergolj) |
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| 159. | Perinatalne bolesti mladunčadi  
*Perinatal diseases of newborns*  
(Marijan Cergolj) |
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| 160. | Klinički aspekti primjenjene endokrinologije reprodukcije muških i ženskih domaćih sisavaca  
*Clinical aspects of applied endocrinology reproduction in male and female mammals*  
(Tomislav Dobranić) |
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| 161. | Biotehnologija rasprođivanja domaćih sisavaca  
*Assisted reproductive technologies in domestic mammals*  
(Iva Getz) |
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| 162. | Porodništvo  
*Obstetric*  
(Tomislav Dobranić) |
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<td>Comparative pathology and ecotoxicology of wildlife</td>
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<td>Specificities of small ruminant nutrition</td>
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<td>171.</td>
<td>History of veterinary medicine in croatia</td>
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<td>Protection mechanisms of mammals central nervous system</td>
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### 3.3. Required and Elective Activities (Participation in Seminars, Conferences, Round Table Discussions etc.) and Criteria for their Expression in ECTS points

Students shall be required to demonstrate their scientific activities through the publication of scientific articles and participation at international and domestic scientific meetings. For a scientific article
published and a journal indexed in CC and SCI as the first author, a student obtains five points, and four points as a co-author. For participation with an oral presentation or poster at an international scientific professional meeting as the first or only author of an article, a student receives four points, and three points as a co-author. For participation with an oral presentation or poster at a domestic scientific meeting author, a student is awarded two points. A student must collect a minimum of ten points from these meetings prior to defending his doctoral dissertation.

3.4. A Description of Each Subject with All the Necessary Components is Attached.

3.5. Rhythm of Studies and Student Obligations

During the first semester, students shall be required to collect a minimum of thirty points from the first point group. Of these, twenty-five points must be from required subjects and five from electives. In the second, third and fourth semesters, they must collect thirty points from the group of branch-oriented subjects, that they will enroll in after consultation with their mentors and study advisors prior to preparing the doctoral dissertation. In the fifth and sixth semesters, they must collect sixty points that refer to the work on the doctoral dissertation. For enrollment in a subsequent semester of studies, a student is required to pass all the examinations that cumulatively bring a minimum of thirty points. In the first semester of studies, the student is required to collect a minimum of twenty points from the group of required methodological subjects.

3.6. System of Counseling and Guidance during Studies, the Manner of Choosing Students, Required Study Advisors and Advisors for Doctoral Dissertations

The criteria for choosing students are presented under Item 2.6. When enrolling in doctoral studies, a student should previously confer with the potential mentor of his doctoral dissertation and in consultation with him and pursuant to the topic of the doctoral dissertation and personal affinities he should select which subjects he will enroll in during an individual semester in order to collect thirty ECTS points. At the Faculty, a commission has been formed for postgraduate studies whose sphere of activities includes the monitoring of the implementation of individual programs for each student. The members of this commission shall also have the role of study advisors and coordinate and supervise the manner of conducting the program for an individual student.

3.7. List of Subjects that Students Shall be Permitted to Select from Other Postgraduate Doctoral and Specialist Study Programs

Students shall be permitted to select subjects from all the specialist postgraduate programs that are conducted at the Faculty of Veterinary Medicine, University of Zagreb, and pursuant to an agreement with the Faculty of Medicine in Zagreb, on the individual level they shall be permitted to choose the following methodological subjects from the doctoral studies in Biomedicine and Public Health: 1. Administration in Science: Research Projects and Business Plans in Biomedicine; 2. Epidemiological Methods in Research, 3. Statistical Analysis of Data in Medicine, 4. Research Methods in Public Health.

3.8. List of Subjects that Can be Conducted in a Foreign Language

All subjects can be conducted on english.

3.9. Criteria and Prerequisites for the Transfer of ECTS Points

The number of ECTS points for each subject shall be awarded on the basis of the total student load in direct and indirect instruction and the time necessary for the preparation of the examination, on the basis of the proposal of the faculty commission for ECTS. The point value of a subject from other studies shall be as stipulated for that study.

3.10. The Manner of the Completion of Studies and the Prerequisites for Registering the Topic of the Doctoral Dissertation; The Procedure and Prerequisites for Approving a Topic for a Doctoral
**Dissertation; The Procedure and Prerequisites for Evaluating a Doctoral Dissertation; The Conditions and Manner for Defending a Doctoral Dissertation**

A student shall register the topic of his doctoral dissertation before enrolling in the third semester of studies or after having collected a minimum of sixty points.

The procedure for the approval of a topic for a doctoral dissertation shall be as follows:

1. A candidate shall submit an application for the approval of the preparation of a doctoral dissertation with detailed explanation of the topic to the Faculty Commission via the Committee for Doctorates. The explanation of the topic should contain the following sections: title, area of investigation, data from the literature, goal, material and methods, anticipated results, scientific contribution, list of the literature, biography of the candidate, list of published works by the candidate.

2. At the proposal of the Committee for Doctorates, the Faculty Commission shall appoint a professional commission for the evaluation of the candidate and the topic of his doctoral dissertation.

3. The professional commission for the assessment of the candidate and the topic shall submit its evaluation and opinion to the Commission for Doctorates no later than within a period of two months. On the basis of the opinion of the expert commission, the Committee for Doctorates shall make a proposal to the Faculty Council for accepting or rejecting the application of the candidate and in the case of acceptance shall also appoint a mentor for the preparation of the dissertation.

4. After the dissertation is completed and written, the mentor of the candidate shall deliver the dissertation to the Committee for Doctorates with the request that the Faculty Council appoint a commission for the evaluation of the doctoral dissertation.

5. At the proposal of the Committee for Doctorates, the Faculty Council shall appoint an expert commission for the evaluation of the doctorate, which shall deliver its report with an evaluation and opinion to the Committee no later than within a period of two months.

6. In the event of a positive opinion and positive evaluation by the expert commission, the Committee for Doctorates shall propose that the Faculty Council accept the positive evaluation and also appoint an Expert Commission for the Defense of the Doctoral Dissertation.

**3.11. Conditions under which Students who Interrupt their Studies or Who Have Lost the Right to Study in a Study Program Shall be Permitted to Continue Their Studies**

Students who have interrupted their studies shall be permitted to continue them provided that they attend the lectures, pass all the stipulated examinations and acquire the required number of points from the previous semester.

**3.12. Conditions under Which a Candidate Acquires the Right to a Certificate for an Absolved Part of the Doctoral Studies Program, as Lifelong Education.**

Pursuant to a special agreement between the Croatian Chamber of Veterinary Medicine and the Faculty of Veterinary Medicine, University of Zagreb, the conditions shall be stipulated for acquiring points within the framework of lifelong education.

**3.13. Maximum Length of the Period from the Beginning to the Completion of Studies**

For full-time students, the maximum length of studies shall five years and for part-time students the maximum period shall be seven years.
4. CONDITIONS FOR STUDIES

4.1. Places Where the Program of Studies Shall be Conducted

The program of studies shall be conducted at the Faculty of Veterinary Medicine, University of Zagreb, the Croatian Veterinary Institute in Zagreb and the Ruder Bošković Institute in Zagreb.

4.2. Information on the Premises and Equipment Anticipated for Conducting the Studies, Especially Information on the Research Resources (Research Equipment, Human Resources)

The Faculty of Veterinary Medicine, University of Zagreb, and other institutions listed under Item 4.1 have research equipment available for conducting the program. At the Faculty, there are currently forty-eight scientific research projects in progress that are financed by the Ministry of Science, Education and Sports of the Republic of Croatia, five projects being financed by the Ministry of Agriculture and Forestry of the Republic of Croatia, and eight projects financed within the framework of international projects. The financing of these projects is a guarantee of the suitable equipment for conducting doctoral studies. Taking into account human resources, it should be emphasized that there are currently forty-eight full professors, twelve associate professors and twenty-seven assistant professors employed.

4.3. List of Scientific and Development Projects on Which the Doctoral Program is Based

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Principal investigator</th>
<th>Young scientist</th>
<th>Department/Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Study of recent and fossil large carnivores of Croatia</td>
<td>Prof. dr. sc. Duro Huber</td>
<td>Tomislav Gomerčić, dr. vet. med.</td>
<td>Department of Biology</td>
</tr>
<tr>
<td>3.</td>
<td>Chlamydophilosis of birds and mammals</td>
<td>Prof. dr. sc. Željko Župančić</td>
<td>Dr. sc. Ksenija Vlahović (do 30. 10. 2003.)</td>
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<tr>
<td>4.</td>
<td>Design and synthesis of drugs for treatment of infections</td>
<td>Prof. dr. sc. Miroslav Bajić</td>
<td>Ivana Stolić, dipl.ing. kemije</td>
<td>Department of Chemistry and Biochemistry</td>
</tr>
<tr>
<td>5.</td>
<td>Health and other biological characteristic of marine mammals in the Adriatic Sea</td>
<td>Prof. dr. sc. Hrvoje Gomerčić</td>
<td>Martina Duras-Gomerčić, dr. vet. med.</td>
<td>Department of Anatomy, Histology and Embryology</td>
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<tr>
<td>7.</td>
<td>Stereologic and histologic evaluation of skin and fur quality</td>
<td>Prof. dr. sc. Ante Hraste</td>
<td>Dr.sc. Srebrenka Nejedli (do 30. 10. 2003.)</td>
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<tr>
<td>8.</td>
<td>Histomorphological studies of the gut of marine fish in aquaculture</td>
<td>Prof. dr. sc. Zvonimir Kozarić</td>
<td>Mr. sc. Snježana Kužir</td>
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<tr>
<td>9.</td>
<td>Quality of Adriatic sea cucumber in processing - &quot;trepang&quot;</td>
<td>Dr. sc. Karmen Botka- Petrak</td>
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<tr>
<td>10.</td>
<td>Effect of low-dose ionizing radiation on chickens</td>
<td>Prof. dr. sc. Petar Kraljević</td>
<td></td>
<td>Department of Physiology and Radiobiology</td>
</tr>
<tr>
<td>11.</td>
<td>Metabolic changes in poultry in stress situation</td>
<td>Prof. dr. sc. Zvonko Stojević</td>
<td>Natalija Filipović, dr.vet.med</td>
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<tr>
<td>No.</td>
<td>Title</td>
<td>Authors</td>
<td>Department/Institute</td>
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<tr>
<td>12</td>
<td>Antioxidant status of domestic animals</td>
<td>Doc. dr. sc. Suzana Milinković-Tur</td>
<td>Department of Animal Nutrition</td>
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<tr>
<td>13</td>
<td>Improvement of nutritive value of some feedstuffs in poultry nutrition</td>
<td>Prof. dr. sc. Vlasta Šerman</td>
<td>Tomislav Mašek, dr. vet. med.</td>
<td>Department of Animal Nutrition</td>
</tr>
<tr>
<td>14</td>
<td>Mycoses as primary and secondary causes of infections of domestic animals</td>
<td>Prof. dr. sc. Ljiljana Pinter</td>
<td>Zrinka Šritot, dr. vet. med.</td>
<td>Department of Microbiology and Infectious Diseases, with Clinic</td>
</tr>
<tr>
<td>15</td>
<td>Immunology and epizootiology of actual animal viral diseases</td>
<td>Prof. dr. sc. Josip Madić</td>
<td>Dr. sc. Nevenka Biuk-Rudan (do 15.9.2003.)</td>
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<td>16</td>
<td>Mycoplasmoses and some opportunistic infections of animals</td>
<td>Prof. dr. sc. Tomo Naglić</td>
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<tr>
<td>17</td>
<td>Phenotypic and genetic trends of meat quality of Simmental cattle</td>
<td>Prof. dr. sc. Ivo Karadjole</td>
<td>Department of Animal Husbandry</td>
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<td>18</td>
<td>The monitoring system of swine pathology</td>
<td>Prof. dr. sc. Tomislav Balenović</td>
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<td>19</td>
<td>Seasonal variations in reproductive performance of Merinolandschaft sheep</td>
<td>Prof. dr. sc. Velimir Sušić</td>
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<tr>
<td>20</td>
<td>Biochemical indicators of meat production in cattle</td>
<td>Dr. sc. Dubravka Križanović</td>
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<tr>
<td>21</td>
<td>Use, biotransformation and kinetics of drugs and vaccines in poultry and chinchillas</td>
<td>Prof. dr. sc. Darko Sakar</td>
<td>Dr. sc. Andreja Prevendar-Crnić (do 30.10.2003.)</td>
<td>Department of Pharmacology and Toxicology</td>
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<tr>
<td>22</td>
<td>Effect of gizzerosine on nitric oxide synthesis and acting in rats</td>
<td>Prof. dr. sc. Željko Grabarević</td>
<td>Ana Beck, dr. vet. med., Mr. sc. Tatjana Trbojević-Vukičević</td>
<td>Department of General Pathology and Pathological Morphology</td>
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<tr>
<td>23</td>
<td>Systematic myopathy of sheep and goat- Diagnosis and prevention</td>
<td>Dr. sc. Branka Artuković</td>
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<tr>
<td>24</td>
<td>Monitoring and control of pathology and rabbit diseases</td>
<td>Prof. dr. sc. Ruža Sabočanec</td>
<td>Ozren Smolec, dr. vet. med. (do 29.02.2004.)</td>
<td></td>
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<tr>
<td>25</td>
<td>New diagnostics of trichinellosis</td>
<td>Prof. dr. sc. Albert Marinculić</td>
<td>Relja Beck, dr. vet. med.</td>
<td>Department of Parasitology and Invasive Diseases</td>
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<td>26</td>
<td>Prevalence of latent toxoplasmosis in sinanthropic rodents</td>
<td>Dr. sc. Viktorija Kutići</td>
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<td>27</td>
<td>Anemia prophylaxis in pigs</td>
<td>Prof. dr. sc. Ante Svetina</td>
<td>Maja Belić, dr. vet. med.</td>
<td>Department of Pathophysiology</td>
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<td>28</td>
<td>Nutritional metabolic relationship as a framework of ruminants health control</td>
<td>Dr. sc. Nina Poljičak-Milas</td>
<td>Mr. sc. Terezija Silvija Marenjak</td>
<td>Department of Animal Hygiene, Environment and Ethology</td>
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<td>29</td>
<td>Emission of air pollution from farms to environment</td>
<td>Prof. dr. sc. Marija Vučemilo</td>
<td>Suzana Hadina, dr. vet. med., Kristina Matković, dr. vet. med.</td>
<td>Department of Animal Hygiene, Environment and Ethology</td>
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<tr>
<td>30</td>
<td>Stable environment influence on the health condition and production on pigs</td>
<td>Doc. dr. sc. Željko Pavičić</td>
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<tr>
<td>No.</td>
<td>Title</td>
<td>Authors</td>
<td>Department/Institution</td>
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<tr>
<td>31</td>
<td>Environment, Stress and Ethology in Swine-production</td>
<td>Prof. dr. sc. Boris Krsnik Mr. sc. Irena Petak, dipl. inž. biologije</td>
<td>Department of Poultry Diseases</td>
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<td>32</td>
<td>Immunoprophylaxis of poultry diseases</td>
<td>Prof. dr. sc. Hrvoje Mazija Mr. sc. Irena Ciglar-Grozdanić, Željko Gottstein, dr. vet. med.</td>
<td>Department of Poultry Diseases</td>
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<td>33</td>
<td>New Opportunities to Control Bacterial Infections of Poultry</td>
<td>Prof. dr. sc. Estella Prukner-Radovčić Danijela Horvatek, dr. vet. med.</td>
<td>Department of Poultry Diseases</td>
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<td>34</td>
<td>Epizootiology and eradication of immunosupresive viral disease</td>
<td>Prof. dr. sc. Zdenko Bidin Mr. sc. Ivana Lojkic</td>
<td>Department of Poultry Diseases</td>
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<tr>
<td>35</td>
<td>Veterinary public health in production of safety food</td>
<td>Prof. dr. sc. Mirza Hadžiosmanović Nevio Zdolec, dr.vet.med.</td>
<td>Department of Hygiene and the Technology of Foodstuffs of Animal Origin</td>
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<tr>
<td>36</td>
<td>Veterinary public health in intensive production of white fish</td>
<td>Prof. dr. sc. Branimir Mioković</td>
<td>Department of Hygiene and the Technology of Foodstuffs of Animal Origin</td>
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<tr>
<td>37</td>
<td>Veterinary Information System</td>
<td>Prof. dr. sc. Marko Tadić</td>
<td>Department of Hygiene and the Technology of Foodstuffs of Animal Origin</td>
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<tr>
<td>38</td>
<td>Veterinary Medicine in Croatia – from the Medeval Past to the Present</td>
<td>Prof. dr. sc. Vesna Vučevac-Bajt Gordana Gregurić-Gračner, dr. vet. med.</td>
<td>Department of Hygiene and the Technology of Foodstuffs of Animal Origin</td>
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<td>39</td>
<td>Activity of plasmatic systems and progress DIC in a babesiosis'</td>
<td>Prof. dr. sc. Vladimir Mrljak Mr. sc. Nada Kučer, dr. sc. Vesna Matijatko,</td>
<td>Internal Medicine Clinic with the Department of Kinology</td>
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<tr>
<td>40</td>
<td>Monitoring of antioxidative status in pigs</td>
<td>Doc. dr. sc. Ivica Harapin</td>
<td>Department of Hygiene and the Technology of Foodstuffs of Animal Origin</td>
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<td>41</td>
<td>Development research into croatian autochthonic dogs and humanity application</td>
<td>Prof. dr. sc. Mario Bauer Mr. sc. Nikša Lemo</td>
<td>Department of Hygiene and the Technology of Foodstuffs of Animal Origin</td>
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<td>42</td>
<td>Transfusiology and blood groups in dogs and cats</td>
<td>Prof. dr. sc. Ljiljana Bedrica</td>
<td>Department of Hygiene and the Technology of Foodstuffs of Animal Origin</td>
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<td>43</td>
<td>Slobodni graft omentuma i regeneracija kalcificiranih tkiva</td>
<td>Prof. dr. sc. Josip Kos Ozren Smolec, dr.vet.med (od 01. 3. 2004.)</td>
<td>Surgery, Orthopedics and Ophthalmology Clinic</td>
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<td>44</td>
<td>Trophoblast protein significance for bovine embryo survival</td>
<td>Prof. dr. sc. Antun Tomašković Silvijo Vince, dr.vet.med</td>
<td>Reproduction and Obstetrics Clinic</td>
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<td>45</td>
<td>Programme of mastitis prevention</td>
<td>Prof. dr. sc. Marijan Cergolj Nino Mačešić, dr.vet.med</td>
<td>Game Biology, Pathology and Breeding Section</td>
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<tr>
<td>46</td>
<td>Influence of puerperium on intercalving interval and service interval in cattle</td>
<td>Doc. dr.sc. Tomislav Dobranić</td>
<td>Game Biology, Pathology and Breeding Section</td>
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<td>47</td>
<td>In vitro breeding and micromanipulation of bovine embryos</td>
<td>Prof. dr. sc. Zdenko Makek Martina Lojkic, dr. vet. med</td>
<td>Game Biology, Pathology and Breeding Section</td>
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<td>48</td>
<td>Applied research on the deer game</td>
<td>Prof. dr. sc. Zdravko Janicki Dean Konjević, dr. vet. med., Krešimir Severin, dr.vet.med.</td>
<td>Game Biology, Pathology and Breeding Section</td>
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<tr>
<td>49</td>
<td>Archaeozoological risearces from Croatia sites</td>
<td>Prof. dr. sc. Krešimir Babić</td>
<td>Department of Anatomy, Histology and Embryology</td>
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</table>
VIP Projects financed by Ministry of Agriculture and Forestry

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<tr>
<th>Title</th>
<th>Principal investigator</th>
<th>Department/Clinic</th>
</tr>
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<tbody>
<tr>
<td>1. Ekopatologija hromosti mliječnih krava</td>
<td>Prof.dr.sc Josip Kos</td>
<td>Surgery, Orthopedics and Ophthalmology Clinic</td>
</tr>
<tr>
<td>2. Uzgoj kunića u obiteljkom gospodarstvima</td>
<td>Prof. dr. sc. Damir Mihelić</td>
<td>Department of Anatomy, Histology and Embryology</td>
</tr>
<tr>
<td>3. Brown hare (<em>Lepus europaeus</em>) breeding in small farms</td>
<td>Prof. dr. sc. Zdravko Janicki</td>
<td>Game Biology, Pathology and Breeding Section</td>
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<tr>
<td>4. Lobster breeding</td>
<td>Dr. sc. Alen Slavica</td>
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<tr>
<td>5. Integrated breeding in aquaculture</td>
<td>Prof. dr. sc. Zdravko Petrinec i Prof. dr. sc. Zvonko Stojević</td>
<td>Department of Biology and the Pathology of Fish and Bees and Department of Physiology and Radiobiology</td>
</tr>
</tbody>
</table>

Other projects

<table>
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<th>Financed by</th>
<th>Title</th>
<th>Principal investigator</th>
<th>Department/Clinic</th>
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</thead>
<tbody>
<tr>
<td>1. MZOŠ</td>
<td>Frogs breeding in captivity</td>
<td>Prof. dr. sc. Zvonko Stojević</td>
<td>Department of Physiology and Radiobiology</td>
</tr>
<tr>
<td>2. MZOŠ</td>
<td>Proizvodnja janjetine sa znakom ekološkog proizvoda Hrvatske</td>
<td>Prof. dr. sc. Miljenko Šimpraga</td>
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<tr>
<td>3. MPŠ</td>
<td>Protokol monitoringa i suzbijanja <em>F. magna</em></td>
<td>Prof. dr. sc. Zdravko Janicki</td>
<td>Game Biology, Pathology and Breeding Section</td>
</tr>
<tr>
<td>4. MZOŠ i Slovenija</td>
<td>Helikobakterioze divljih glodavaca</td>
<td>Prof. dr. sc. Željko Grabarević</td>
<td>Department of General Pathology and Pathological Morphology</td>
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<tr>
<td>5. MZOŠ i Slovenija</td>
<td>Istraživanje keratinolitičkih aktivnosti dermatofita različitih domaćina i staništa</td>
<td>Prof. dr. sc. Ljiljana Pinter</td>
<td>Department of Microbiology and Infectious Diseases, with Clinic</td>
</tr>
<tr>
<td>6. MZOŠ i Velika Britanija</td>
<td>Conservation genetics of large carnivores in Croatia (ALIS project)</td>
<td>Prof. dr. sc. Đuro Huber</td>
<td>Department of Biology</td>
</tr>
<tr>
<td>7. MZOŠ i Slovenija</td>
<td>Epidemiološka istraživanja klamidioze (Clamydophila psittaci) u domaćih i divljih životinja te pouzdanosti različitih dijagnostičkih postupaka za dokaz protutijela i antigena, izolacije uzročnika i serotipizacije uporabom PCR i RFLP-PCR postupka</td>
<td>Prof. dr.sc. Željko Župančič</td>
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</table>
4.4. Institutional Management of the Doctoral Program

The doctoral program coordinates the sections for doctoral studies of the Faculty of Veterinary Medicine, University of Zagreb, under the supervision of the assistant dean for postgraduate studies. For this purpose, a computer program for following the work of each individual student shall be employed.

4.5. Contractual Relations between Students and the Institution Providing Doctoral Studies, or Cooperating Institutions: for Acquiring Credit Points, Performing Research Work, Defending Doctoral Dissertations and Performing the Required and Elective Activities

The Regulations on Doctoral Studies shall determine the contractual relations mentioned under this item.

4.6. Names of the Instructors and Associates Who Shall Participate in Each Subject

The data under this item are to be found with the proposed program for each subject.

4.7. List of the Educational Workshops for Conducting Studies (Instruction and Research Work)

The Departments and Clinics of the Faculty of Veterinary Medicine, University of Zagreb:

a) Departments:
1. Department of Biology
2. Department of Physics
3. Department of Chemistry and Biochemistry
4. Department of Anatomy, Histology and Embryology
5. Department of Physiology and Radiobiology
6. Department of Animal Nutrition
7. Department of Microbiology and Infectious Diseases, with Clinic
8. Department of Animal Husbandry
9. Department of Pharmacology and Toxicology
10. Department of General Pathology and Pathological Morphology
11. Department of Parasitology and Invasive Diseases
12. Department of Pathophysiology
13. Department of Biology and the Pathology of Fish and Bees
14. Department of Radiology, Ultrasound Diagnostics and Physical Therapy
15. Department of Animal Hygiene, Environment and Ethology
16. Department of Poultry Diseases
17. Department of Hygiene and the Technology of Foodstuffs of Animal Origin
18. Department of Humanities in the Veterinary Profession, with the following:
   19. Veterinary Economics Section
   20. Sociology of the Veterinary Profession Section
   21. History of Veterinary Medicine Section
22. Physical Education Section
23. Foreign Languages Section
24. Department of Forensic and Judicial Veterinary Medicine

b) Clinics:
25. Internal Medicine Clinic with the Department of Kinology
26. Surgery, Orthopedics and Ophthalmology Clinic
27. Mobile Clinic
28. Reproduction and Obstetrics Clinic

c) Sections:
29. Game Biology, Pathology and Breeding Section

d) Scientific-Informatics Units
30. Library

4.8. The Optimal Number of Students Permitted to Enroll, Taking into Account the Premises, Equipment and Number of Instructors, Especially the Number of Potential Advisors on Doctoral Topics

Currently there are eighty-seven instructors at the Faculty who are members of the profession of scientific educators, from assistant professors to full professors. Under the condition that studies should be completed by full-time students within four years, the optimal number of enrolled students should be twenty per year, in order for each advisor on doctoral topics to be able to devote sufficient time and work to one student and bring that student to the successful completion of the doctoral studies, preparation of the dissertation and defense of the dissertation within a period of four years.

4.9. Estimated Expenditures for Conducting the Doctoral Program and the Fees per Student

The expenditures for conducting the doctoral program vary, depending on the courses that a student takes and the topic of the doctoral dissertation or upon the range of necessary experiments on animals. Taking into account the financial situation of our students, the fees for studies per semester shall be 9,000.00 kunas.

4.10. Financing of the Doctoral Program

The fees for the studies of full-time students, i.e. scientific novices, should be covered by the Ministry of Science, Education and Sports of the Republic of Croatia. Other students shall cover the fees for their studies themselves. For students who cover the fees for their studies, contracts shall be signed, pursuant to which the rights and obligations of students shall be regulated.

4.11. Quality of the Doctoral Program

The quality and success of the implementation of the doctoral program shall be assessed on the basis of student questionnaires, after taking individual subjects, passing examinations, the completion of studies and the defense of the dissertation. At the Faculty, the Commission for Doctorates has been established, whose task shall be the constant monitoring of the quality of conducting the courses and the dynamics of including students in work on scientific projects. Evaluations of competency shall be requested from the employers of persons who have earned doctorates of science. The final evaluation of the program shall be issued by the expert group of the European Association of Establishments for Veterinary Education (EAEVE), which according to guidelines shall issue an assessment of all the instructional programs at the Faculty every seven to ten years.
FIRST CREDIT GROUP

M1. Željko Grabarević, Frane Božić
METHODS OF SCIENTIFIC AND RESEARCH WORK

Duration (in hrs): 16 lectures, 8 practical, 6 students’ homework. Credits: 6,0.

Outline: Lectures: Science and scientific experiment. Scientific areas (field and disciplines). Scientific research in regard to research methods as well as to the level and aim of investigation. Hypothesis. Experiments. Materials (samples) for experiments. Methods used in experiments. Presentation of results of experiments. Biomedical research and statistics. Evaluation of statistically significant differences between variables. Publishing of results of experiments. Categorization of papers. Original scientific paper. Scientific style used in scientific paper. Structure (chapters) and content of an original scientific paper. Doctorial dissertation - structure (chapters), content and technical equipment. Requirements for Ph. D. Other forms of presenting scientific information (poster, oral presentation).

Practical: 1) Assessment and presentation of experiment results. 2) Bibliographic sources (databases and other sources of information) and their search. 3) Organization (structure) and analysis of content of original scientific paper. 4) Harvard system of citing references.

Students’ homework: 1) Searching for relevant journal articles referring to the problem of study. 2) Analysis and presentation of results (personal or obtained by mentor or lecturer). 3) Literature citing containing references on a certain problem of study.

Development of general and specific competences (knowledge and skills): Students will obtain knowledge and skills needed for a successful research work starting with finding out a problem, and learning how to set hypothesis, make trials, write a paper and publish it. They will also learn to evaluate critically a certain paper as well as results published in it. Students will be taught how to make entry for doctoral degree how to make doctoral thesis and defend it. And finally, they will get used to look into another way of reporting their own results.

Co-lecturers: Damira Kraljević, BA, Librarian

Recommended literature:

Examination: written.

Manner of supervising the quality and performance of subject: Student poll

COURSE LEADER’S CV

M2. Marija Vučemilo
ETHICS AND WELFARE IN THE VETERINARY MEDICINE EXPERIMENTAL WORK
Duration (in hrs): 15 lectures, 5 seminars. Credits: 5,0.


Development of general and specific competences (knowledge and skills): The basic purpose of this subject is to introduce the students to the concept of ethics and welfare in connection to the experimental animals and the experimental work in the veterinary medicine, acquiring the skills for its recognition as well as its application in the scientific research and the everyday practice, respectively.

Co-lectures: Mr. sc. Irena Petak

Recommended literature:
Zakon o dobrobiti životinja RH (NN 19/99).

Examination: Oral or written

Manner of supervising the quality and performance of subject: Students' poll

COURSE LEADER'S CV

M3. Velimir Sušić
STATISTICAL METHODS IN VETERINARY RESEARCH

Duration (in hrs): total 20: lectures 6, practicals 8, seminars and consultations 6. Credits: 6,0.

Outline: Lectures: data types and measurement characteristics of variables in veterinary research, data distributions, types of research studies and statistical hypothesis, sample size, choice and power of statistical tests, statistical significance of differences between two or more data groups, comparison and analysis of differences between categorical data, correlation and regression.
Practicals: data analysis by statistical softwares
Seminars and consultations: critical analysis of statistical methods in published scientific article

Development of general and specific competences (knowledge and skills):
Co-lecturers: Ivo Karadjole, PhD, full professor; Tomislav Balenović, PhD, full professor (possibly scientists from other institutions from Croatia or abroad).

Recommended literature:
Priručnici statističkih programa (SAS, Statistica for Windows)

**Examination:** written and oral

**Manner of supervising the quality and performance of subject:**

**COURSE LEADER'S CV**

Velimir Sušić, PhD, associated professor

Department of animal husbandry, Veterinary Faculty University of Zagreb, Heinzelova 55, 10 000 Zagreb, tel. 385 01 2390 224; 385 01 2390 122; fax: 385 01 2441 390; e-mail: susic@vef.hr

Velimir Sušić was born in Zagreb 1959. After finishing primary and high school, he graduated at The Veterinary Faculty University of Zagreb in 1983. In 1989 he obtained masters degree (Frequencies of genes determining sera transferin polymorphism in sheep and correlation with production traits) and in 1993 PhD degree with thesis «Variability of body measures and milk production in sheep with different haemoglobin types». In 1985 he was positioned as assistant, in 1998 as assistant professor and in 2001 as associated professor in the department of animal husbandry at The Veterinary Faculty University of Zagreb. He teaches obligatory subject Technology of animal production and breeding and elective subject Statistics. He was attending to the course in statistics, SAS software and to the Symposium Statistical methods scientific research. As visiting scientist in 1990 he worked at Bayerische Landesanstalt für Tierzucht, Munich - Germany (Department for sheep and small animals), and in 2004. participated in The FAO/IAEA Training Course on Molecular Methods in Livestock Genetics and Breeding (Seibersdorf, Austria). As collaborative scientist he participated in one international research project and in five research projects which were supported by Croatian Ministry of science. From 2001 he was principal investigator in two scientific-research projects. Also, he works as assistant of chief editor in journal «Veterinary archive» and member of editorial board in journal «Veterinary station». In 2000 he was president of the scientific committee of the 2nd Croatian Veterinary Congress.

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**M4. Ivica Harapin:**

**INFORMATICS IN BIOMEDICINE**

**Duration (in hrs):** 3 lectures, 12 exercises. Credits: 3.0.

**Outline:**


**Development of general and specific competences (knowledge and skills):** Student is able to use computers for scientific work using data basis and programs for prepearing and analysing obtained data.

**Co-lecturer:** Alan Hrastnik, dr. vet. med

**Recommended literature:**


Manuals for Microsoft Office programs – different publisher

Handbook of Centar for online data basis IRB-a: "Priručnik za pretraživanje online baze podataka"

**Examination:** during semester and written at the end of semester

**Manner of supervising the quality and performance of subject:** student's judgement and criticisam after finish course

**COURSE LEADER'S CV**
Ivica Harapin was born on 02. of March 1956. in Zagreb. Secondary school (VI gimnazija) and Faculty of Veterinary Medicine finished in Zagreb. From 1980 - 1983 he was employed in Veterinary Station Bosanska Dubica and from 1983 on Faculty of Veterinary Medicine in Zagreb (Clinic for Outdoor Patient, Clinic for Internal diseases). 1990 he postgraduate with thesis "Control of metabolism in high productive diary cows" and 1996 doctoral thesis "The meaning of glutathion peroxidase in myocardiopathia and myophatia in beef cattle". He published about 60 papers and four books and internal scripts. Main researcher is in project "Monitoring of antioxidative status in pigs". In 2004 he was elected for associate professor.

Selected publications:

M5. Tihana Žanić Grubišić
ENZYMES AND ENZYMATIC COMPLEXES IN CELLULAR METABOLISM

Duration (in hrs): 14 lectures and 6 seminars. Credits: 1.5.

Outline:
Lectures: Structure - function relationships in protein families, architecture of protein molecules, primary, secondary, tertiary and quaternary structure. Basic concepts in enzyme catalysis

Development of general and specific competences (knowledge and skills):

It is anticipated that student will gain general knowledge in enzymology and organisation of the enzyme systems within the cell. After completing the course students should be able to critically comprehend basic principles and regulation of the enzyme activity within the organism. This knowledge is necessary for the research, as well as, for the professional work, whenever the effects of physiological and pathological conditions need to be studied and monitored. Good command in enzymology is important for making correct decisions in selecting rational diagnostic parameters for follow up of drug therapy or else.

Recommended Literature:

Examination: oral examination and written essay on the selected topic form the current scientific literature

Manner of supervising the quality and performance of subject: Anonymous students’ questionnaires

COURSE LEADER'S CV
Tihana Žanić Grubišić, Ph. D. Full professor of Biochemistry
Born in Zagreb, graduated from the Faculty of Pharmacy and Biochemistry, University of Zagreb in 1974, obtained M. Sc. in Experimental Biology, University of Zagreb in 1976, and Ph.D. in Chemistry from University of Zagreb in 1982. Nominated for the position of assistant professor of Biochemistry at the Faculty of Pharmacy and Biochemistry in 1986, associated professor in 1996 and full professor in 2001. Currently is holding position of Head of the Department for Medical Biochemistry and Haematology at Faculty of Pharmacy and Biochemistry, University of Zagreb. Postdoctoral studies at FEBS Advanced Course on Glycoconjugates, Lille, France (1982); Seminar on Biophysics and Molecular Biology: DNA Replication and Repair in Eucaryotes, Duino, Italy, (1986), McGill University, Montreal, Canada, (1988). Employed as visiting research fellow (European Community grant), research scientist (Cystic Fibrosis Trust) and principal investigator of the Tempus project - (Teaching Biochemistry to the students of Medicine) at the Department of Human Anatomy University of Oxford, United Kingdom in 1990-1991 and 1992-1993, 1995 i 1996. 1999. Principal investigator in 3 international projects and 3 home projects financed from Ministry of Science and Technology. Main research interests - molecular basis of signal transduction pathways and their activation in the cell exposed to stress,, in particular, during the course of chronic diseases (toxic nephropathy, diabetes and chronic diseases of the respiratory tract). Molecular mechanisms in development of apoptosis and necrosis (MAP kinases, heat shock proteins, amylin and complications in diabetes), experimental toxicology, oxidative stress and reactive oxygen species (superoxide dismutase) and ecto - enzymes of mammalian cell. Member of the Croatian Society for the Medical Biochemistry, Croatian Society for the Biochemistry and Molecular Biology and Society for the Study of Inborn Errors of Metabolism, United Kingdom.

Selected publications:


Rumora L., Hadžija M., Barišić K., Maysinger D., Žanić-Grubišić T. Amylin-induced cytotoxicity is associated with activation of caspase-3 and MAP kinases Biological Chemistry, Hoppe-Seyler, 2002; 383,1751-1758.


**M6. Mira Grdiša: COMPARATIVE BIOCHEMISTRY**

**Duration (in hrs)** Totally 16 hours (14 hrs lectures, 2 hrs practices). Credits: 3.5.

**Outline:** The lectures will include the basic knowledge of biochemistry, its importance in a life, the knowledge about biological structures and metabolic processes. Basic molecules, as a component of the macromolecules (amino acids – their biosynthesis and catabolism, nucleotides – their biosynthesis and catabolism). Structure and function of nucleic acids and proteins, technology of recombinant DNA – cloning). Signal transduction pathways, cell cycle and its regulators, control of proliferation, differentiation...
and apoptosis. Deregulation of cell behavior, basic principals of tumorigenoses, oncogenes, growth factors and potential therapy (gene therapy, antisens technology, protein transduction). Also the basic methods in biochemistry and molecular biology will be presented (isolation, purification and detection of nucleic acids and proteins, “in vitro” technology, experimental animals, micro array, gene sensor).

Practice: Presentation of a method for detection of nucleic acids (electrophoresis on agarose gel) and proteins (Western blot, ELISA)

**Development of general and specific competences (knowledge and skills):** With these lecture, the students will recognize the basic biochemical and molecular biological roles in the life of organisms. That would help them in solving of experimental problems.

**Recommended Literature:**

- *Voet D*, *Voet JG*: *Biochemistry* (John Willey & Sons, NY 1990)
- *Stryer L*: *Biochemistry*
- *Ausubel FM, Brent R; Kingston RE, Moore DD*; *Seidman JG*; *Smith JA; Struhl K*: *Short protocols in Molecular Biology*

**Examination:** Verbal

**Manner of supervising the quality and performance of subject:** The students questioner.

**COURSE LEADER'S CV**

Mira Grdiša, Ph.D. senior research associate and principal investigator; associate professor  
*Division of Molecular Medicine, Rudjer Boškovic Institute, Zagreb, Bijenicka 54, Croatia, phone: 456 11 10, fax: 456 10 10, Email: grdisa@rudjer.irb.hr*

Mira Grdisa is presently a senior research associate at Department of Molecular Medicine at Rudjer Bošković Institute and a Principal Investigator on the Project (Influence of gene/protein transduction on the signaling pathway of transformed cells) funded by Croatian Ministry of Sciences and Technology Republic of Croatia. Her major research interest include biochemical aspects of protein transduction into cells. She is involved in teaching and mentoring students. Birth: December, 21 1948, Nationality: Croatian. Education: 1988. - Ph.D. in Chemistry - Biochemical Sciences, "Ruder Bošković" Institute, Zagreb; 1975. - M.Sc. in Molecular Biology, University of Zagreb, Zagreb, Croatia; 1972. - B.Sc. of Organic Chemistry Faculty of Technology, University of Zagreb, Croatia; Research and professional experience: 2002 - present: senior research associate, Department of Molecular Medicine; associate professor, Faculty of Veterinary Medicine, University of Zagreb; 1998 - 2002: Research Associate, Department of Molecular Medicine, "Ruder Bošković" Institute; 1999-2000 - sabbatical, Department of Hematology and Oncology, Hospital Hotel Dieu, Paris, France; 1998 - Visiting Scientist, Institute of Molecular Genetics, Academy of Science of the Czech Republic, Prague, Czech Republic; 1995 - Visiting Scientist, Department of Biochemistry, McGill University, Montreal, Canada; 1994 - Visiting Scientist, Montreal Neurological Institute, Montreal, Canada; 1990 - 1992 Postdoctoral Fellow, Department of Biochemistry, McGill University, Montreal, Canada; 1992-1996 “Study of differentiation of avian red blood cells”, Ministry of Science and Technology, Republic of Croatia; 1995-1998 COST 862 “Ruminants Mycoplasmes”, adjoin project founded by European Economic Community; 1994-1998 “Testing of antitumor activity of new synthesized compounds”, Pliva Research Institute, Zagreb; 1998 - Antitumor activity of new synthesized compounds, Faculty of Chemical Engineering, Zagreb; Main Research Interest: Regulation of cell cycle, induction of apoptosis - Biochemical and molecular basis of changes during differentiation and maturation of red blood cells - Expression of particular proteins and related genes, responsible for red cell maturation - Regulation mechanisms of gene expression - Antitumor activity of some substances, mechanisms of action - Tumor suppressor genes, proliferation of tumor cells; Professional involvement: Member of Review Advisory Board; Journal of Molecular Biology and Biotechnology; European Council of Cell Biology, Biochemistry and Biotechnology; Colloquia Anthropologic; Chemistry in Industry; International Journal of Biochemistry & Cell Biology; citation in "Who is who in the world"; International Biographical Centre Cambridge; BEST Europe; award the scholarship from "Association Claude Bernard" Paris - 1 year; Publication: 42 (39 in CC, 3 in SCI)
Selected publications:

M7. Mira Grdiša, Sonja Levanat:
FUNCTIONAL ASPECTS OF GENETICAL AND BIOCHEMICAL EVENTS IN NORMAL AND TUMOR CELL

Duration (in hrs): Totally 20 hours (lectures 16, seminars 4). Credits: 4,5.

Outline: The purpose of the course is to present new insight in normal cell functioning, cell cycle regulation, signal transduction within cell and among the cells, as well as the malfunctions in these processes. The cell functions will be present in molecular genetic and biochemical aspects, using in vivo and in vitro models. The course will be include knowledge about the cells and cell cycle, protein expression during cell cycle regulation, the role of growth factors and protooncogenes in cell functions, signal transduction, gene activation and inactivation, gene map, recessive and dominant heritable diseases. Apoptosis and blocking factors of apoptosis. Phosphorylation and dephosphorylation - phosphatases, kinases and their inhibitors. Molecular biology methods: nucleic acid isolation and protein purification, detection methods (chromatography, immunochemistry, electrophoresis), fluorescent and radioactive labelling of fragments and/or cells, polymerase chain reaction, different types of hybridization (northern, western, dot blot, southern, in situ, subtractive and differential); experimental models: cell cultures, paraffin slices, experimental animals.

Development of general and specific competences (knowledge and skills): With these lecture, the students will recognize the basic biochemical and molecular biological roles in the life of organisms. This knowledge could help in planing the experiments.

Recommended Literature:
Watson JD et al Recombinant DNA, Sci Am Books, 1992;
Voet D, Voet JG: Biochemistry (John Willey & Sons, NY 1990)
Stryer L: Biochemistry
Darnel J; Lodish H; Baltimore D: Molecular Cell Biology, 1990.
Ausubel FM, Brent R; Kingston RE, Moore DD; Seidman JG; Smith JA; Struhl K: Short protocols in Molecular Biology

Examination: Verbal form with presentation of selected scientific paper

Manner of supervising the quality and performance of subject: The students questioner.

COURSE LEADER'S CV

Mira Grdiša, Ph.D. senior research associate and principal investigator; associate professor
Division of Molecular Medicine, Rudjer Boskovic Institute, Zagreb, Bijenicka 54, Croatia, phone: 456 11 10, fax: 456 10 10, Email: grdisa@rudjer.irb.hr

See course M6.

Selected publications:


Sonja Levanat, Ph D

Division of Molecular Medicine, Rudjer Bošković Institute, Zagreb, Bijenicka 54, HR-10000 Zagreb, Croatia, phone: +385-1-4561110, e-mail: levanat@rudjer.irb.hr

Sonja Levanat presently is a senior research associate at Department of Molecular Medicine at Rudjer Bošković Institute and Principal Investigator on Project (Signaling pathways in tumorigenesis and development) funded by Croatian Ministry of Sciences and Technology Republic of Croatia. Her major research interest include molecular genetic aspects of genes involved in development and cancer. She is involved in teaching and mentoring students during their diploma work before graduation and master and Ph D degree for postgraduate students at the University of Zagreb. Birthday: October 14, 1953, Krško, Slovenia; nationality: Croatian. Position title: senior research associate and principal investigator. Major education: 1988 Ph D Experimental Oncology; University of Zagreb, Croatia; M Sci of Medical Biochemistry; Faculty of Sciences, University of Zagreb; 1978 B Sc of Organic chemistry and Biochemistry; Faculty of Sciences, University of Zagreb; Research and Professional Experience: 1996 - present - Principal investigator, senior research associate; Division of Molecular Medicine, Rudjer Bošković Institute, Zagreb; 1993 - 1995 Postdoctoral fellowship, Department of Genetics Yale University School of Medicine, New Haven, CT, USA, American Brain Society Award; 1990 - 1992 Research associate, Department of Molecular Medicine, Rudjer Bošković Institute, Zagreb; 1989 - 1990 Postdoctoral fellowship, Institute for Physiology University Clinics Eppendorf, University of Hamburg, Germany; 1984 - 1988 Research assistant, Department of Experimental Biology and Medicine, Rudjer Bošković Institute, Zagreb; 1980 - 1983 Assistant, Department of Experimental Biology and Medicine, Rudjer Bošković Institute, Zagreb.
Institute, Zagreb; 1978 - 1979 - Assistant, Department of Organic Chemistry nad Biochemistry, Rudjer Bošković Institute, Zagreb, Croatia; Grants and awards: 2002 present Ministry of Science and Technology, Republic of Croatia0098091 “The SHH/PTCH/SMO signaling pathway in tumorigenesis and development”; 2002 - 2004 Croatian-Austrian joint project “The role of the SHH/PTCH/SMO pathway in oncogenesis. Mechanisms of regulation of the SHH/PTCH/SMO pathway in different pathological conditions”; 1997 - 1999 Croatian-Slovenian joint project “Molecular aspects of malignancy”, Ministry of Sciences and Technology, Republic of Croatia and Ministry of Sciences and Technology, Republic of Slovenia; 1996 - 2001 Ministry of Sciences and Technology, Republic of Croatia 00981102, “The role of Gorlin syndrome in malformations and tumor development”, principal investigator; 1979 student award for diploma experimental work, Farmaceutical company “Krka”, Slovenia; Memberships: European Association for Cancer Research (EACR), Croatian Society of human genetics, Croatian Society for biochemistry and Molecular Biology, Association for oncogenes and growth factors at HAZU (Croatian Academy of Sciences and Arts). Professional involvement: teaching and mentoring students during their diploma work before graduation and master and Ph D degree for postgraduate students at the University of Zagreb; -citation in "Who is who in the world"; International Biographic Centre Cambridge; BEST Europe

Selected publications:


M8. Mira Grdiša:
METHODS OF MOLECULAR BIOLOGY IN VETERINARY MEDICINE

Duration (in hrs): Totally 15 hours (lectures 12, practise 3). Credits: 2.0.

Outline: Molecular biology methods: isolation and detection of nucleic acid, restriction enzymes, isolation and purification of proteins (chromatography, electrophoresis – native, SDS, 2-D) detection methods qualitative and quantitative, immunochemical methods, fluorescent and radioactive labelling of fragments and/or cells, polymerase chain reaction (PCR), real time PCR, different types of hybridization (Northern,
Western, Dot blot, Southern, In situ), recombinant DNA technology, protein transduction, gene therapy, anti-sens technology, microarray, protein array, experimental models: cell cultures, experimental animals.

Development of general and specific competences (knowledge and skills): In this subject students will learn the basic methods in biochemistry and molecular biology. This gives an opportunity for working in laboratory.

Recommended Literature:
Ikić D, Pavelić K, Spaventi R. Onkogeni i Faktori rasta, JAZU, Globus, Zagreb,1989;
Watson JD et al Recombinant DNA, Sci Am Books, 1992;
Voet D; Voet JG: Biochemistry (John Willey & Sons, NY 1990)
Stryer L: Biochemistry
Darnel J; Lodish H; Baltimore D: Molecular Cell Biology, 1990.
Ausubel FM, Breut R; Kingston RE, Moore DD; Seidman JG; Smith JA; Struhl K: Short protocols in Molecular Biology

Examination: Verbal

Manner of supervising the quality and performance of subject: The students questioner.

COURSE LEADER'S CV
Mira Grdiša, Ph.D. senior research associate and principal investigator; associate professor
Division of Molecular Medicine, Rudjer Boskovic Institute, Zagreb, Bijenicka 54, Croatia, phone: 456 11 10, fax: 456 10 10, Email: grdisa@rudjer.irb.hr
See course M6.

Selected publications:
**Duration (in hrs):** Total 23 (10 lectures, 5 seminars, 8 field practice). Credits: 2,0.


Seminars: Analyses of environmental influence of work of each student in the class.

Practice/field: Visit to the Zagreb garbage dump (types and quantities of garbage, ways of disposing, problems, influence on domestic and wild animals). Visit to Nature park Lonjsko polje (sustainable livestock husbandry in protected areas, conservation of autochthonous breeds)

**Development of general and specific competences (knowledge and skills):** The course is developing the student competence in two directions. In the first place it increases her/his environmental awareness about the influence of the entire scope of veterinary activities. In this way the resources and the global ecological balance are conserved. On the other hand the acquired knowledge leads the student to apply it in the scientific work, both as the part of methodology, and the use of data collected. Reviewed journal require the ethical relation towards environment, but also publish the research in that direction.

**Co-lecturers.** Dr. sc. Josip Kusak, Tomisla Gomerčić, DVM

**Recommended Literature:**


**Examination:** Seminar paper on the influence of professional work of candidate. Oral exam.

**Manner of supervising the quality and performance of subject:** Knowledge and understanding is regularly controlled during the course teaching in seminars and in the field. Students prepare and solve given tasks. Quality is controlled by student questionnaire and a survey of success.

**COURSE LEADER CV**

Prof. dr. sc. Duro Huber

Biology Department, Veterinary faculty, Heinzelova 55, 10000 Zagreb, Hrvatska

Djuro Huber was born in Zagreb in 1950. After completing the study of veterinary medicine in 1975, Djuro Huber specialized in ecology (masters study). In 1979 he defended his doctor of science degree in wildlife parasitology. In 1979/80 he had a postdoctoral training in Wild Animal Disease Center in Fort Collins, Colorado, USA, on a Fulbright grant. Since 1981 he is conducting a brown bear study in Croatia which is continually the project of the Croatian Ministry of Science. For several years he was leading the projects of National Geographic Society (USA), International Bear Association, Euronatur, Bernd Thies Foundation and U.S. - Croatian science technology program. The study included radio-telemetry tracking, and was in late 1980s expanded to the program of repopulating of brown bears in Western Europe. Since 1996 he is leading the project "Study of large carnivores in Croatia" which includes bear, wolf and lynx. So far Djuro Huber has published 82 scientific papers (list enclosed), 95 professional papers, and 114 abstracts of conference presentations. Along with the brown bear and wolf research in Croatia he is involved in the activities of several NGO-s dealing with the basic ecology or environmental protection. Croatian Ecological Society (past Council member), Croatian Biological Society (past secretary and Council member), IUCN Species Survival Commission for bears, co-chair BSG for Europe, IUCN Species Survival Commission for wolves, International Bear Association (Council member and past Vice-president for Europe and Asia), WWF Large Carnivore Initiative for Europe (Core Group member), Wildlife Disease Association, European Wolf Network. Djuro Huber is currently the professor of Biology at the Department of Biology at the Veterinary Faculty in Zagreb. Within the course of Biology for the Students of Veterinary Medicine he is primarily teaching Ecology and Animal taxonomy.

**Selected publications:**


**M10. MIROSLAV BENIĆ, ŽELJKO MIHALJEVIĆ: VETERINARY EPIDEMIOLOGY**

**Duration (in hrs):** Total 20 (lectures 10, seminars 5, exercises 5). Credits: 2.0.

**Outline:** Introduction to epidemiology, collecting and analysis of epidemiological data, measure of disease occurrence, measures of effect and impact, dynamics of infection, types of epidemiological study (prevalence and incidence study, case-control study, cohort study, clinical trial, controlled field trial, selection of appropriate study design, presentation and summarization of epidemiological data, surveillance, interpretation of diagnostic tests results, sample size calculation, causality, research of disease in a group of animals, review of literature.

**Development of general and specific competences (knowledge and skills):** Identify key considerations in the planning and design of epidemiological studies, understand and apply measures of disease frequency, recognise the principles of different study designs and be aware of their strengths and limitations, select an appropriate study design to address specific question, evaluate results of diagnostic tests, use computer programmes to calculate sample size, appreciate the issues that need to be considered when judging whether there is causal link between exposure and disease, evaluate the results and interpretation of published studies.

**Recommended Literature:**


Fletcher,R.H., Fletcher,S.W. and Wagner,E.H. 1996: Clinical epidemiology. 3 rd ed., Williams & Wilkins, Baltimore, U.S.A


**Examination:** written and oral exam

**Manner of supervising the quality and performance of subject:** By the end of teaching unit students will fill in questionnaire expressing their opinion concerning teaching unit namely whether content fulfills their expectations, whether teaching unit requires more hours, evaluation of lecturers and their proposal for improvement of teaching unit.

**COURSE LEADERS CV**

**Dr. sc. Miroslav Benić**

Born on 26 July 1967 in Davor. Admitted to study veterinary medicine at Veterinary faculty University of Zagreb where graduated on 1994. Since 1995 has been working at Veterinary institute in Zagreb as a young researcher at the Dept. of mastites and raw milk quality. He attended MSc course at Veterinary faculty in Zagreb in 1996. After completion the course and accepting the project titled *Bacteria isolated from raw goat and ovine milk* on 5 January 2000 he achieved master title in microbiology and epizootiology. During 1999/2000 academic year he attended masters course on veterinary epidemiology at the London school of hygiene and tropical medicine. After accepting the project titled *Seroepidemiological evidence of Brucella abortus free status of Republic of Croatia* he achieved title Master of science in veterinary epidemiology. Since January 2001 he has been in the position of head of the Dept. of mastites and raw milk quality at Veterinary institute. Dissertation titled *Different cell count in cow udder secretion from quarters infected by streptococci and staphylococci* defended on 13 May 2004. He has published 20 scientific and professional articles.

**Selected publications:**


**Bidin, Snježana, Ružica Blažević, M. Benić, I. Udovičić, S. Topolko (2000):* Učinkovitost suspenzije Ampivet* ™ k forte u liječenju mastitisa krava u laktaciji*. PRAXIS VETERINARIA 48 (1-2) 65-70


Mihaljević, Ž.; Bara Vinković; M. Benić; Marija Vučemilo; Mira Đukić; Draženka Gutmirtl (2001): Obilježja seoskih gospodarstava u Baranji obzirom na mogućnost zadržavanja glodavaca. 4. znanstveno stručni skup iz DDD-a s međunarodnim sudjelovanjem Zdravo očuvati zdravim u novom tisućljeću, Bizovačke Toplice, 10.-12. svibnja 2001. Zbornik radova


Mr.sc. Željko Mihaljević

Born on 9 September 1971 in Zagreb. Admitted to study veterinary medicine at Veterinary faculty University of Zagreb where graduated on 1997. Since then has been working at Veterinary institute in Zagreb as a young researcher at the Dept. of pathology. He attended MSc "Animal pathology" course at Veterinary faculty in Zagreb in 1998. After completion the course and accepting the project titled Pathologic changes in gastrointestinal system of different age categories of swines in a large scale swine farm on January 2002 he achieved master title in veterinary pathology. During 1999/2000 academic year he attended masters course on veterinary epidemiology at the London school of hygiene and tropical medicine. After accepting the project titled Rabies in Croatia he achieved title Master of science in veterinary epidemiology. Since January 2001 he has been in the position of scientific assistant on the Dept. transmissive spongiform encephalopaties and ruminant pathology at Veterinary institute.

Selected publications:


M11. Ivica Valpotić, Maja Popović: Molecular biology in veterinary

Duration (in hrs): 15 lectures, 5 seminars, 10 practicals. Credits: 2.5.


Practical: Demonstration of molecular biology/genetics methods for veterinary medicine (flow cytometry, cell sorting, PCR, RT-PCR, DNA-typing, DNA hybridization, image analyzer morphometry).

**Development of general and specific competences (knowledge and skills):** After learning of thematic unit student will be able to: critically accept and analyze contemporary trends in development of molecular basics of biomedical sciences, especially of veterinary medicine and public health, and recognize the aspects of practical application of functional and clinical genomics with veterinary practice; recognize potential benefits and risks of use of the genome technologies in veterinary medicine; understand and apply basic methods of cell investigations in veterinary practice with special aspects of their differentiation into either cellular and molecular defense elements or functionally altered cells.

**Co-lecturer:** Mirna Brkljačić, DVM

**Recommended Literature:**


**Examination:** Oral

**Manner of supervising the quality and performance of subject:** according to the Statute of the University of Zagreb, according to students and international review

COURSE LEDERS CV

Ivica Valpotić, Ph.D., full professor

Department of Biology, Veterinary Faculty, University of Zagreb, Heinzelova 55, 10000 Zagreb, tel.: 01 2390-144, e-mail: valpotic@vef.hr


Education: 1972 - B.S., Biology, Faculty of Science, University of Zagreb; 1979 - M.S., Immunology, Veterinary Faculty, University of Zagreb; 1983 - Ph.D. - Veterinary Immunology, Faculty of Science, Zagreb; Memberships: Croatian Biological Society; Secretary (1985-1987), Vice-president (1993-1995); President (1995 -1998); Croatian Immunological Society; Executive Board (1993-2000); American Association of Veterinary Immunologists (1989- ); Veterinary Immunology Committee of the IUIS, correspondent (1993- ); Society for Mucosal Immunology (1997- ); Employment and duties: 1972-74 Tissue Typing Center, Faculty of Medicine, University of Zagreb - Graduate Research Assistant; 1974-76 Institute of Physiology and Pathology in Animal Production, Zagreb - Research Fellow; 1976-83 Scientific Fund of Croatia, Zagreb - Sci. Administrator; 1983-88 Pig-breeding Center, Veterinary Faculty, University of Zagreb - Immunologist; Sci. Collaborator (1984-88), Senior Sci. Collaborator (1989-90); 1988-89 National Animal Disease Center, (NADC) USDA-ARS, Ames, Iowa , USA - Visiting Scientist; 1990-91 Department of Biology (DB), Veterinary Faculty (VF), University of Zagreb (UZ) - Immunologist; Sci. Adviser (1990-2002), full professor (2002 - ) 1991- Present DB, VF, UZ - Research Leader Immunology Lab., Graduate Teaching Assistant; 2002-Present, DB Full professor, 2002- Present, Faculty of Science University of Zagreb, Guest full professor; Education and specialization: 1983 i 1984 Prof. A. Gali, Privatklinik Edenkoben, Njemačka, “Stem cell culture and regeneration”; 1988-89 E. A. Dean, NADC, USDA -ARS, IA, USA "Pilus receptors in porcine small intestine"; 1991 Prof. C.R. Stokes, University of Bristol, College of Veterinary Sciences, Division for Molecular Biology, Bristol, Engleska, “Swine gut immune cells: mucosal immunity and tolerance”; 1990-92 J. K. Lunney, Helminth Disease Lab, USDA-ARS, Beltsville, MD, USA, "1st Swine CD Workshop Testing: T cell subsets"; 1990-93 E. A. Dean-
Nystrom, NADC, USDA - ARS, "Cell-mediated immune response to porcine enterotoxigenic F4 (K88) -piliated Escherichia coli"; 1993-95. Saalmüller A - Federal Research Center for Virus Diseases of Animals, Tübingen, Germany. 2nd Swine CD Workshop Testing: T and B cell subtypes; 1996-98. Haverson K, University of Bristol, Veterinary College, Division of Molecular and Cellular Biology. 3rd Swine CD Workshop Testing: T and B cell FCM and immunohistology analyses; 2002 Prof. B. Nagy Veterinary Medical Institute of Hungarian Academy of Sciences, Budapest, Magyars, “Live oral non GMO vaccine against postweaning colibacillosis of swine”; Main Research Interest: Cellular immunity to bacterial/viral/parasitic infections in domestic food animals; Mucosal (intestinal) immunity to E. coli in swine; Immune response modifiers/vaccines against porcine postweaning colibacillosis. Publications: Total journal/proceeding articles 131 (45 in CC)

Selected publications:
Gerenčer M, I Valpotić, B Jukić, M Tomašković, I Bašić 1989 Qualitative analyses of cellular immune functions in equine infectious anemia show homology with AIDS. Arch Virol 104: 249-257
Valpotić I, E A Dean, H W Moon 1989 Phenotyping of pigs for the presence of intestinal receptors mediating adhesion of enterotoxigenic Escherichia coli-bearing K88ac pilus antigen by ELISA. Vet Archiv 59: 161-175
Vijtiuk N, S Ćurić, G Lacković, I Udovičić, I Vrbanac, I Valpotić 1995 Histopathological features in the small intestine of pigs infected with F4ac+ non-enterotoxigenic or enterotoxigenic strains of Escherichia coli J Comp Path 112: 1-10
Valpotić I, N Vijtiuk, K Trutin-Ostović, T A Casey, E A Dean-Nystrom, G Lacković. 1994 Identification and distribution of CD+ T cell subsets in porcine gut following experimental infection with F4ac+ enterotoxigenic Escherichia coli (ETEC) or non-ETEC strains. Regional Immunol 6: 387-390

Maja Popović, Ph.D., assistant professor
Department of Biology, Veterinary Faculty, University of Zagreb, Heinzelova 55, 10000 Zagreb, tel.: 01 2390-135, e-mail: popovic@vef.hr

Personal Data: April 14, 1968, Zagreb, Croatia, married, 1 daughter, Citizenship: Republic of Croatia
Home Address: Mlinovi 139, 10000 Zagreb, Croatia, Phone: +385 (1) 4617–688. Education: 1993 - B.S., Veterinary faculty, University of Zagreb; 1996 - M.S., Physiology, Veterinary Faculty, University of Zagreb; 1999 - Ph.D. - Veterinary Molecular Biology, Veterinary Faculty, Zagreb; Memberships: Croatian Veterinary Society; Croatian Biological Society; Croatian Immunological Society; Employment and duties: 1993. Assistant, Department of Biology, Veterinary Faculty, University of Zagreb; 2003. Assistant professor, Department of Biology, Veterinary Faculty, University of Zagreb; Education and specialisation: 1993.-1995. - Visiting Scientist, Division of Molecular Medicine,Ruder Bošković Institute; 1996. – Visiting Scientist, Pliva- research institute, Zagreb; 1998.-1999. - Visiting Scientist, Division of Molecular Medicine,Ruder Bošković Institute; 1998. - ICLAS/FELASA Educational Programme on Laboratory Animal Science in Central Europe, Budapest, Hungary; 1999. – Visiting Scientist, Ratiopharm-
pharmaceutical industry, Ulm, Germany; 2003.-2004. Visiting Scientist, Clinical Hospital Merkur, - flow cytometry education; 2004. – Visiting Scientist, Agroselect - «GMO-education» Venlo, Nederland; Main Research Interest: Regulation of cell cycle, Signaling pathways in normal and tumors cells, Biological and molecular genetics aspects of eucariotic cell (changes during cell differentiation), Flow cytometry; Publications; Total journal/proceeding articles 46 (8 in CC).

Selected publications:


Hrženjak M.T.; Roguljić A.; Efenberger-Marinculić P.; Popović M.; Pišl Z (1996).: Total IgA and IgG of patients with different primary malignancies. Pathology Oncology Research 2:66-68.


M12. Ivica Valpotić, Maja Popović:
CELLULAR AND DEVELOPMENTAL BIOLOGY

Duration (in hrs): 15 lectures, 5 seminars, 10 practicals. Credits: 2,5.

Outline: Lectures: Basic principles in studying of euKaryotic cells, tissues and organs; Primary cell cultures; Permanent cell lines; Growth factors, differentiation molecules in model of cell culture; Cell cyclus and cell death; Tissue interactions; Transdifferentiation of cells in vitro; Comparative presentation of crucial genes and molecules for developmental processes of gametogenesis; Phases of early embrional development in eukaryotes (from sea urchin to mammals); Embryonic stem cells; Differentiation of pluripotent stem cells in vitro; Major histocompatibility system; Transgenic laboratory animals.

Seminars: Protocols and applications of methods for isolation cells and tissues for in vitro studies; immunophenotyping and quantification by flow cytometry, functional tests in vitro, immunohistochemical localization and morphometric analysis.

Practical: Demonstration of methods for isolation of cells and tissues ( lymphocyte stimulation test, direct cytosis, antibody dependent cellular cytosis, immuno/hisocytochemistry ).

Co-lecturer: Ana Kovšca –Janjatović, BS; Mirna Brkljačić, DVM

Development of general and specific competences (knowledge and skills): After learning of thematic unit student will be able to: recognize and analyze contemporary trends in development of cytology and cytogenetics in biomedical sciences, particularly in veterinary medicine and public health; relate the aspects of in vitro and ex vivo manipulations with cells and/or cell cultures for requirements of veterinary practice; consider a significance of cellular “biological clock” for preventive and therapy in veterinary medicine; synthesize the knowledge about molecular regulation of organogenesis and development with the events during cell differentiation and morphogenesis; understand gene and functional alterations of cells.
Recommended Literature:


Examination: Oral

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb, according to students and international review

COURSE LEDERS CV

Ivica Valpotić, Ph.D., full professor

Department of Biology, Veterinary Faculty, University of Zagreb, Heinzelova 55, 10000 Zagreb, tel.: 01 2390-144, e-mail: valpotic@vef.hr

See course M11.

Selected publications:


Gerenčer M, I Valpotić, B Jukić, M Tomašković, I Bašić 1989 Qualitative analyses of cellular immune functions in equine infectious anemia show homology with AIDS. Arch Virol 104: 249-257


Valpotić I, E A Dean, H W Moon 1989 Phenotyping of pigs for the presence of intestinal receptors mediating adhesion of enterotoxigenic Escherichia coli-bearing K88ac pilus antigen by ELISA. Vet arhiv 59: 161-175


Vijtiuk N, S Ćurčić, G Lacković, I Udovičić, I Vrbanac, I Valpotić 1995 Histopathological features in the small intestine of pigs infected with F4ac⁺ non-enterotoxigenic or enterotoxigenic strains of Escherichia coli J Comp Path 112: 1-10


Valpotić I, N Vijtiuk, K Trutin-Ostović, T A Casey, E A Dean-Nystrom, G Lacković. 1994 Identification and distribution of CD⁺ T cell subsets in porcine gut following experimental infection with F4ac⁺ enterotoxigenic Escherichia coli (ETEC) or non-ETEC strains. Regional Immunol 6: 387-390


Maja Popović, Ph.D., assistant professor
### Selected publications:

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Journal</th>
</tr>
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<tbody>
<tr>
<td>Hrženjak T.; Popović M.; Božić T.; Grdiša M.; Kobrehel Lj.</td>
<td>Fibrinolytic and anticoagulative activities from the earthworm Eisenia fetida.</td>
<td>Comparative Biochemistry and Physiology B 119:825-832</td>
</tr>
<tr>
<td>Grdiša M., Popović M., Hrženjak T.</td>
<td>Glycolipoprotein extract (G-90) from earthworm Eisenia fetida exerts some antioxidative activity.</td>
<td>Comparative Biochemistry and Physiology, 47:233-341</td>
</tr>
<tr>
<td>Vitiuk N., Trutin-Ostović K., Balenović T., Popović M., Valpotić I.</td>
<td>Functional and phenotypic analyses of porcine gut immune cells immunized by oral administration of F4ac(+) nontoxigenogenic Escherichia Coli strains.</td>
<td>Veterinarski arhiv 47:333-341</td>
</tr>
<tr>
<td>Hrženjak M.T.; Roguljić A.; Efenberger-Marinculić P.; Popović M.; Pišl Z</td>
<td>Total IgA and IgG of patients with different primary malignancies.</td>
<td>Pathology Oncology Research 2:66-68</td>
</tr>
<tr>
<td>Hrženjak T.; Popović M.; Tiška-Rudman Lj.</td>
<td>The fibrinolytic activity of earthworm extract (G-90) on lysis of fibrin clots originated from the venous blood of patients from malignant tumors.</td>
<td>Pathology Oncology Research 4:206-211</td>
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### M13. Marko Radačić

#### LABORATORY ANIMALS AND ANIMAL MODELS USED IN BIOMEDICAL RESEARCH PROGRAMS

**Duration (in hours):** Lectures 20, Seminar 5, and Exercises 5 hrs. Credits: 3.0.

**Outline:** The aim of this course is to give the students the basic knowledge of laboratory animals, which are mainly used in biomedical research, as well as the general characteristics of animal models used in different biomedical research program. Here are the main topics of this subject: Ethics and bioethics in animal research; Croatian, European and World legislative in the use of laboratory animals in scientific work; What is an animal experiment and who can it use; What is GLP; Animal facilitates; Health status and its monitoring before and during experimental time; Nutrition requirement and sp. diet; Diseases caused and transmitted by lab. Animals (zoonoses and allergy); Surgical and non-surgical techniques and procedures; Treatment of pain in experiment; Experimental design and Statistical evaluation; Post-mortem procedure; The use of germ free, flora-defined mice, nude mice, knockout mice and some other unusual animals; Birds as experimental animals; Reptilians and Amphibians as experimental animals.

**Development of general and specific competencies (knowledge and skills):** After passing the exam student will get main knowledge and skills about breeding and maintaining laboratory animal, as well as who and which animal to use for specific research project. Also students will be able after some time to teach younger students about the use of laboratory animals in an appropriate experiment.

**Recommended literature:**

Examination: Written and/or oral exam

Manner of supervising the quality and performance of subject: Anonymous student’s questionnaires

COURSE LEADER'S CV
Marko Radacic, Prof., Ph.D., D.V.M.

Date of birth: April 2nd, 1943. Place of birth: Ostrogasica, Drnis, Croatia. Citizenship: Croatian. Marital status: married, 2 adult children (MD & Dipl. iur.). Education: Elementary school (8 yrs), Unesic (1959); High school Classical Gymnasium, 4 yrs, Sinj (1966); University: Veterinary Faculty (5 yrs), University of Zagreb, DVM Diploma (1972); Postgraduate Education (Ph.D. studies): University of Zagreb 1973-1975; Ph.D. Thesis: Leukaemia’s of mice as models for preclinical research, University of Zagreb (1976); Management course: Certificate for a teacher in entrepreneurship, Zagreb 1999; PT Scheme Training: Operation and Use of Proficiency testing Schemes, DZNM, Zagreb, 08-09.03.2004.; Professor in Biomedical science at The University of Rijeka, Medical faculty, Rijeka (2002 -); Professor in Biomedical science at The High Medical School, Zagreb, 2002; employment: Veterinary Faculty University of Zagreb (1972); Rudjer Boskovic Institute (1973 -) ; management: 1. Head of the Laboratory for animal breeding unit (1979-1980); 2. Head of the Department of experimental biology and medicine (1993-1995); 3. Head of the Division of experimental biology (1995-1997); 4. Head of the Laboratory for animal breeding unit (2001- 2003); 5. Member of Management board of "R.Boskovic" Institute (1996 - 2000) ; fellowships: Christie Hospital and Holt Radium Institute, Paterson Laboratories, Manchester; a) 1973, - 3 months; b) 1977-1979, - 18 months; Royal Marsden Hospital, Cancer Research Institute, Sutton, 1982, - 3 months; Danish Cancer Society, Department of experimental Clinical Oncology, Aarhus.; a) 1998, - 6 months; b) 1990, - 2 months; c) 1994 - 1995, - 10 months; membership in scientific & professional societies: 1. Croatian Physiologic. Soc. (President 1983-1987); 2. Yug. Physiol. Soc. (Vice-president 1985-1988) ; 3. Croatian Immunol. Soc.; Croatian Radiobiological Soc. ; 5. Croatian Veterinarian Soc.; American Assoc. Cancer Res. ; Internat. Physiol. Soc.; European Soc. Hyperthermia Oncology; European Assoc. Cancer Res.; European Soc. Therapeutic Radiology Oncology ; EORTC – Drug Development Committee (former Screening and Pharmacology Group); teaching: 1. High Medical School Zagreb - graduate students (Physiology); 2. High Medical School Zagreb - graduate students (Physiology & Anatomy); 3. High Medical School Split (Zagreb) - graduate students (Physiology & Anatomy); 4. Medical Faculty, University of Rijeka graduate students (Biology of Pest and their influence on human health and environment); 5. Medical Faculty, University of Zagreb - postgraduate students (Exper. oncology) ; 6. Medical Faculty, University of Rijeka - postgraduate students (Biomedical sciences); 7. Faculty of Natural Sciences, University of Zagreb - postgraduate students (Biol. & Physiol. sci.); 8. Veterinary Faculty, University of Zagreb - postgraduate students (Laboratory animal science); 9. University of Osijek – postgraduate students (Biology of rodent and insects and their influence on environment and human health) ; 10. Mentor (supervisor) for 5 Ph.D. students and 10 graduate (diploma) students; 11. Participant in several HTV and HR-Radio education programme; publications: 1. Over 70 scientific papers published in scientific journals; 2. Over 80 congress papers published in abstract book and/or Proceedings book; 3. Editor of one book; editorial: Member of editorial board of Croatian sci. journals: Libri oncologici.; Against cancer, Food; languagees: English (active & passive); German (passive); Danish (passive); award: Croatian innovators Diploma in 1989.

Relevant teacher's papers:


M14. Željka Cvrtila Fleck
BIOCHEMICAL AND BIOLOGICAL ANALYTICS IN VETERINARY MEDICINE

Duration (in hours): 20 (lectures, seminars, practical). Credits: 1.5.


Development of general and specific competences (knowledge and skills): Interpretation of the relevance of biochemical methods for biomedical research in veterinary science. Training to enable the students to perform scientific work.


Recommended literature


Examination: written and oral exam.

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb.

COURSE LEADER’S CV
NUMBER OF HOURS: Total 30 (10 hours of lectures, 15 hours of practice, 5 hours of seminar). Credits: 4,5.


DEVELOPMENT OF GENERAL AND SPECIFIC COMPETENCES (KNOWLEDGE AND SKILLS): Having passed the exam in functional morphology of poultry and game birds the postgraduates will obtain fundamental knowledge of poultry and game birds functional morphology which is the basis for postgraduate study, conected with poultry and game birds study.


LITERATURE FOR THE ATTENDANTS:
Evaluation of knowledge achievements: Oral exam.

Manner of supervising the quality and performance of subject: Student’s questionnaire, collaboration between teachers and students.

CURRICULUM VITAE OF THE HEAD PROFESSOR:
Prof. dr. Vesna Gjurčević Kantura

Department of Anatomy, Histology, and Embryology, Faculty of Veterinary Medicine, University of Zagreb, 10000 Zagreb, Heinzelova 55, Croatia

1948 Born in Ciglenik, Slavonski Brod; 1967 High school in Slavonski Brod; 1967 Enrolled as student at the Faculty of Veterinary Medicine in the University of Zagreb; 1971-1974 Student tutor at the Institute of Anatomy, Histology and Embryology; 1974 Part-time assistant professor for the subject «Anatomy, histology and embryology» at the Institute of Anatomy, Histology and Embryology; 1976 Full-time assistant professor at the Institute of Anatomy, Histology and Embryology; 1981 M.Sc. degree at the Faculty of Veterinary Medicine in the University of Zagreb; 1987 Sc.D. degree; 1987 Assistant professor; 1992 Senior assistant professor; 1998 Senior professor; 2003 Professor's tenureship granted.

Selected papers:

G2. Zvonimir Kozarić, Snježana Kužir
HISTOLOGICAL, HISTOCHEMICAL AND MORPHOMETRIC PROCEDURES IN BIOMEDICAL SCIENCES

Number of hours: Total 20 (8 hours of lectures, 10 hours of practice, 2 hours of seminar). Credits: 3,0.

Subject contents: Lectures: Measuring methods and their purpose. Histological and histochemical techniques and measuring methods in microscopic and macroscopic analysis. Procedures applicable to the evaluation of meat quality and meat products, of skin and other tissues and of organic systems. Types of staining and of chemical materials used for making of histologic and histochemical preparations.
Practice: Way of taking and delivery of materials, laboratory workshop (making of histologic and histochemical preparations). Other types of measuring in macroscopic anatomy.
Seminar: Analysis of the obtained preparations by means of light microscope, study of the findings, analysis of macroscopic measurements.

Development of general and specific competences (knowledge and skills): After and of lessens student will be relevant for work in laboratory for histological and histochemical examinations.

**Literature for the attendants:**


**Evaluation of knowledge achievements:** Oral exam.

**Manner of supervising the quality and performance of subject:** Consulting if needed.

**CURRICULUM VITAE OF THE HEAD PROFESSOR:**

<table>
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<th>G3.</th>
<th>Srebrenka Nejedli:</th>
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<td>MORPHOLOGY, BREEDING AND THE WAY OF KEEPING CAGE BIRDS</td>
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**Number of hours:** In total 15 hours (10 hours of lectures, 5 hours of practice). Credits: 2,5.

**Subject contents:** Lectures: Anatomical and histological differences concerning the construction of organs and of their systems within the birds kept in cages. Anatomical structure of muscles as a basis for the application of medicaments. Selection of healthy birds, way of their keeping and feeding previous to the mating. Procedures in order to obtain healthy descendents. Types of cages, location of cages and aviaries within the home. Psychological acquaintance of birds (canaries, parrots, and some exotic species). Procedures in order to preserve the birds in good health, protection from zoonosis and other illnesses.

Practice: Proper bird handling techniques within or out of the cage or aviary and while operating the bird. Ways of checking the health status and the administering of medicaments. Taking of the materials for bacteriological analysis and of blood samples.

**Development of general and specific competences (knowledge and skills):** After and of lessens student will be relevant for work with birds in veterinary clinics.

**Literature for the attendants:**


**Evaluation of knowledge achievements:** Oral exam.

**Manner of supervising the quality and performance of subject:** Consulting if needed.

**CURRICULUM VITAE OF THE PROFESSORS:**

**Srebrenka Nejedli, Sc.D.**
Department of Anatomy, Histology, and Embryology, Faculty of Veterinary Medicine, University of Zagreb, 10000 Zagreb, Heinzelova 55, Croatia

Born in 1965 in Zagreb. Elementary school and high school in Zagreb. Graduated at the Faculty of Veterinary Medicine in the University of Zagreb (1991). Postgraduate studies of anatomy, histology and embryology – M.Sc. in 1994, Sc.D. in 1999. Employed at the Institute of Anatomy, Histology and Embryology at the Faculty of Veterinary Medicine in the University of Zagreb: Scientific recruit and Junior
assistant (1992-2003), Assistant professor since 2003. Participation in four scientific projects. Head of an initial project financed by the Croatian Ministry of Science. Author and/or coauthor of some 50 papers. Participation with papers read at numerous scientific symposiums in Croatia and abroad. Member of several professional associations and of the organizing and scientific committee of the I. Croatian-Slovenian congress on exotic and wild animals.

Selected papers:

G4.  Damir Mihelić
THE ANATOMY OF THE GAME AND THE FEATHERED GAME

Number of lessons: Total 45 (15 lessons of lecturing, 30 lessons of practice). Credits: 5,5.

Contents of subject: Lectures: Basis of anatomy of skeletal system of mammals. Comparative anatomy of the skeletal system of the wild mammals: red deer (Cervus elaphus L.), roe deer (Capreolus capreolus L.), brown bear (Ursus arctos L.), boar (Sus scrofa ferus L.), hare (Lepus europaeus Pall.), pheasant (Phasianus colchicuc L.), mallard (Anas platyrhyncos L.) and partridge (Perdix perdix L.). Specific quality of skeletal system of the game in Croatian region.

Practice: Comparative skeletal system: separately bones and skeleton. Section.

Development of general and specific competences (knowledge and skills): Students will understand all forms of locomotion and understanding possibilities of function for each muscle groups which are suitable for consumption.

Literature for attendants:

Method of examine: verbally exam.

Manner of supervising the quality and performance of subject: Student’s questionnaire, collaboration between teachers and students.

BIOGRAPHY OF SUBJECT LEADER:
G5. Vesna Gjurčević Kantura, Tatjana Trbojević Vukičević
COMPARATIVE CONFORMATION OF AUTOPODIUM FOR VETERINARY ORTOPEDIC NEEDS

Number of lessons: Total 45 (15 lessons of lecturing, 30 lessons of practice). Credits: 6,0.

Contents of subject: Lectures: Comparative osteology, arthrology, myology, and account of blood vessels and nerves of the autopodium. Anatomical and histological conformation of hoof, ungula and claw.

Practice: Section of the fresh and preserved preparations of the autopodium.

Development of general and specific competences (knowledge and skills): Students will make up achieved knowledge which will facilitate understanding of pathological changes and usage of modern orthopedic applications.

Literature for attendants:

Method of examine: verbally exam.

Manner of supervising the quality and performance of subject: Student’s questionnaire, collaboration between teachers and students.

BIOGRAPHY OF SUBJECT LEADER:

---

G6. Damir Mihelić:
ANATOMICAL, HISTOLOGICAL AND GENETICAL APPROACH TO VETERINARY FORENSICS

Number of lessons: Total 45 (15 lessons of lecturing, 30 lessons of practice). Credits: 6,0.


Practice: anatomical and histological indicators used in determination.

Development of general and specific competences (knowledge and skills): Students will facilitate appliance of achieved knowledge in basic and initial forensic approaches with DNA application.

Literature for attendants:

Method of examine: verbally exam.

Manner of supervising the quality and performance of subject: Student’s questionnaire, collaboration between teachers and students.

BIOGRAPHY OF SUBJECT LEADER:

<table>
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<th>G7.</th>
<th>Tajana Trbojević Vukičević:</th>
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<tr>
<td>APPLIED ARCHAEZOZOOLOGY</td>
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Number of lessons: Total 45 (15 lessons of lecturing, 30 lessons of practice). Credits: 5,5.


Practice: Preparation of zoological material, marking, data-base entering, anatomical recognizability - comparative approach.

Development of general and specific competences (knowledge and skills): Get inside the basic archaeozoological methods. Learn to determine skeletal elements and taxonomic affiliation. Learn to classify animal’s age and sex based on tooth eruption and attrition and long bones epiphysis fusing/unfusing. Learn to evaluate animals withers height and biomass. Know how to recognize basic taphonomical processes on animal bones. Recognize and distinguish traces on bones: chewing marks, disarticulation and butchering traces, animal bones and horns processing into tools and ornaments. Learn to write archaeozoological results and insert it into entire archaeological report.

Assistants in teaching: prof. dr. sc. Damir Mihelić, dr. sc. Tatjana Tušek, mr. sc. Tajana Trbojević Vukičević i dr. sc. Dejana Brajković

Literature for attendants:


**Method of examine:** verbally exam.

**Manner of supervising the quality and performance of subject:** Student’s questionnaire, collaboration between teachers and students.

**BIOGRAPHY OF SUBJECT LEADER:**

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<th>G8.</th>
<th>Snježana Vuković:</th>
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<tr>
<td></td>
<td>Developmental principle of congenital malformation in domestic animals</td>
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**Number of hours:** 12 (lectures 6, seminars 6). Credits: 3.5.


**Development of general and specific competences (knowledge and skills):** Knowledge of the principles of development is essential to understanding congenital malformations which include all abnormalities arising during prenatal development, regardless of the cause. In clinical practice veterinarians encounter many anatomical and physiological anomalies whose pathogenesis occurs during development. Responsibilities of properly qualified persons include not only identification, diagnosis and treatment, but also appreciation of possible causes of such conditions.

**Cooworkers:** Prof.dr.sc. Hrvoje Gomerčić, prof.dr.sc. Zvonimir Kozarić, prof.dr.sc. Stipica Ćurić, mr.sc. Hrvoje Lucić

**Literature for the students:**


**Selected references from the journals**

**Evaluation of knowledge:** essay + oral exam

**Manner of supervising the quality and performance of subject:** Anonymous questionnaire of the students in every teaching year.

**CURRICULUM VITAE:**

Doc.dr.sc. Snježana Vuković
G9.

Tomislav Gomerčić:
MARINE MAMMALS SYSTEMATISC AND EVOLUTION

Number of hours: Total 30 (10 hours of lectures, 10 hours of practice, 10 hours of seminar). Credits: 4.0.


Practice: Skeleton comparision of domestic and marine mammals.
Seminar: Seeing and critical discussions of selected TV-emissions on marine mammals.

Development of general and specific competences (knowledge and skills): Students will obtain knowledge about systematic and evolution of the big group of animals that is economically used in some parts of the world yet. Most important is knowledge about biology of the marine mammals as group of endangered species, and protected by law in the whole world. That is the reason for professional education of scientists and competent persons whose will be able to work on scientific investigation and managing of those animals on scientific bases. Ultimate objective is protection of that endangered large mammals species, protection of the marine biocenoses of the seas, and conservation of the biological diversity in the marine habitats.


Literature for the attendants:
Evaluation of knowledge achievements: Oral exam

Manner of supervising the quality and performance of subject: Anonymous questionnaire of the students in every teaching year.

CURRICULUM VITAE OF THE PROFESSOR

**G10. Tomislav Gomerčić:**

**BIOLOGY AND FUNDAMENTAL PHYSIOLOGY OF MARINE MAMMALS**

**Number of hours:** Total 60 (15 hours of lectures, 35 hours of practice, 10 hours of seminar). Credits: 6.0.

**Subject contents:** Lectures: Basic characteristics of biology and morphology with physiological fundamentals of pinnipeds (Pinnipedia). Basic characteristics of biology and morphology with physiological fundamentals of cetaceans (Cetacea). Basic characteristics of biology and morphology with physiological fundamentals of sirenia (Sirenia). Basic characteristics of biology and morphology with physiological fundamentals of eared seals (Otariidae) and true seals (Phocidae). Basic characteristics of biology and morphology with physiological fundamentals of monk seals (Monachus). Basic characteristics of biology and morphology with physiological fundamentals of baleen whales (Mysticeti) and toothed whales (Odontoceti). Basic characteristics of biology and morphology with physiological fundamentals of bottlenose dolphin (*Tursiops truncatus*).

Practice: Skeleton comparasion of pinnipeds and cetaceans. Skeleton comparasion of some species of toothed whales.

Field practice: Study of skeletons of marine mammals in Croatian Natural History Museum. Observations of bottlenose dolphin population in the Adriatic Sea from research boat. Observations of bottlenose dolphins in aquarium in Riccione (Italy).

Seminar: Seeing and critical discussions of selected TV-emissions on marine mammals.

**Development of general and specific competences (knowledge and skills):** Students will obtain knowledge about biology, and partially about physiology of the big group of animals that is economically used in some parts of the world yet. Most important is knowledge about biology of the marine mammals as group of endangered species, and protected by low in Croatia and in the whole world. That is the reason for professional education of scientists and competent persons whose will be able to work on scientific investigation and managing of that animals. Ultimate objective is protection of the marine biocenoses of the Adriatic and all other seas, and conservation of the biological diversity in the marine habitats.


**Literature for the attendants:**


Evaluation of knowledge achievements: Oral exam

Manner of supervising the quality and performance of subject: Anonymous questionnaire of the students in every teaching year.

CURRICULUM VITAE OF THE PROFESSOR

| G11. | Martina Đuras Gomerčić:  
|      | ANATOMY OF BOTTLENOSE DOLPHIN (Tursiops truncatus) |

**Number of hours:** In total 75 hours (15 hours of lectures, 60 hours of practice). Credits: 5,5.


**Development of general and specific competences (knowledge and skills):** Students will obtain knowledge about general anatomy of the bottlenose dolphin in this subject. That species is the nearest to the human between all others cetaceans, especially in dolphinariums, and need veterinary care. This is endangers species protected by low in Croatia and in whole world, and that is the reason for professional education of scientists and competent persons whose will be able to work on scientific investigation and managing of that animals. Ultimate objective is protection of the marine biocenoses of the Adriatic and all other seas, and conservation of the biological diversity in the marine habitats.


**Literature for the attendants:**


Evaluation of knowledge achievements: Oral exam

Manner of supervising the quality and performance of subject: Anonymous questionnaire of the students in every teaching year.

CURRICULUM VITAE OF THE PROFESSOR

G12. Hrvoje Lucić, Martina Duras Gomerčić:
CETACEAN BIOLOGY AND PATHOLOGY IN THE ADRIATIC SEA

Number of hours: In total 105 hours (15 hours of lectures, 90 hours of practice). Credits: 6.0.


Practice: Carcass sections of the cetaceans stranded in Croatian part of the Adriatic Sea. Forestomach contents analyses of dolphins stranded in Croatian part of the Adriatic Sea. Cyclic changes of the Adriatic Sea dolphin ovaries. Histology of particular organs of the Adriatic Sea dolphins. Estimation of the Adriatic Sea dolphin age according to dentinal grow layer group (GLG). Establishing of the past reproductive activity of stranded female dolphins of the Adriatic Sea. Collecting of parasites and their developmental stages from dolphin carcasses stranded in Croatian part of the Adriatic Sea. Identification of the individual bottlenose dolphins according to the photos taken down in the Adriatic Sea.

Field practice: Usage of GPS (Global Positioning System) equipments. Follow up from research boat particular dolphin schools and study their activity. Photographing of particular dolphins for photoidentification. Skin biopsy of wild dolphins. Carcass section of cetaceans stranded in the Adriatic Sea.

Development of general and specific competences (knowledge and skills): Students will obtain knowledge about biology and diseases of the whales in the Adriatic sea, especially of the bottlenose dolphin (Tursiops truncatus) as a resident species and other species of whales which are temporarily appear in the Adriatic Sea. That are endangered species protected by low in Croatia and in whole world, and that is the reason for professional education of medical directed scientists whose will be able to work on the health monitoring of the population. That species is situated at the top of the food chain in the Adriatic Sea and it is ideal object for the health monitoring of the whole Adriatic biocenose. Scientists whose are educated in this manner will be able to work on the future investigations and managing of that animals at scientific base. Ultimate objective is protection of the marine biocenoses of the Adriatic and all other seas, and conservation of the biological diversity in the marine habitats.


65
Literature for the attendants:


T. Kuiken: Diagnosis of By-Catch in Cetaceans. European Cetacean Society. Saskatoon, Saskatchewan, Canada, 1996.


Evaluation of knowledge achievements:

Manner of supervising the quality and performance of subject: Anonymous questionaire of the students in every teaching year.

CURRICULUM VITAE OF THE PROFESSOR


Number of hours: In total 35 hours (5 hours of lectures, 30 hours of practice). Credits: 4,0.

Subject contents: Lectures: Species determination by morphological and molecular methods. Basic knowledge of dolphin photoidentification. Sex determination by morphological and molecular methods. Age determination of dolphins by dentinal grow layer groups (GLG). Osteometry. Establishing the familiar relationship between animals of the same species.

Practice: Morphometry of dolphin's body. Anatomy of skeleton and osteometry of the Adriatic Sea dolphins. Photoidentification of the slides of the bottlenose dolphins from the Adriatic Sea. Preparing the histological slices of dolphin teeth for dentinal GLG analysis. Taking the cetacean tissue specimens for the molecular studies. Practice in Molecular laboratory for ordering cetacean's species, sex, and establishing familiar relationship between dolphins of the same population or ordering the animal belonging to different populations.

Development of general and specific competences (knowledge and skills): Students will obtain knowledge about morphological and molecular methods in the investigation of the marine mammals. That are endangers species protected by low in Croatia and in whole world, and that is the reason for professional education of scientists whose will be able to work on big group of animals that is economically used in some parts of the world yet. Most important is knowledge about populations investigations of the
marine mammals as group of endangered species, and protected by low in Croatia and in the whole world. That is the reason for professional education of scientists and competent persons whose will be able to work on population investigations and managing of those animals. Ultimate objective is protection of the marine biocenoses of the Adriatic and all other seas, and conservation of the biological diversity in the marine habitats.


Literature for the attendants:


Evaluation of knowledge achievements: Oral exam

Manner of supervising the quality and performance of subject: Anonymous questionnaire of the students in every teaching year.

CURRICULUM VITAE OF THE PROFESSOR


Number of hours: 200 (20 hours of lectures, 180 hours of practice). Credits: 10,0.

General content: Lectures: Bones of fishes, amphibians, reptiles, birds and mammals. Skeleton joints of the fishes, amphibians, reptiles, birds and mammals. Skeletal muscles of the fishes, amphibians, reptiles, birds and mammals. Biomechanics of the locomotion apparatus of the fishes, amphibians, reptiles, birds and mammals.

Practice: Comparison between skeleton of the fishes, amphibians, reptiles, birds and mammals. Dissection and microscopic structure of the muscles of the fishes, amphibians, reptiles, birds and mammals.

Development of general and specific competence (knowledge and skills): Students will obtain knowledge about locomotion system of the vertebrates and will understand evolution of that system and its comparative structure from fishes to mammals. That knowledge is a base for completely understanding of the comparative biology, pathology and its clinical appliance in understanding of complete vertebrates morphology.


**Literature for the attendants:**


**Evaluation of knowledge achievements:** Oral exam

**Manner of supervising the quality and performance of subject:** Anonymous questionnaire of the students in every teaching year.

**CURRICULUM VITAE OF THE PROFESSORS**

<table>
<thead>
<tr>
<th>G15.</th>
<th>Martina Duras Gomerčić, Tajana Trbojević Vukičević</th>
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<td><strong>COMPARATIVE MORPHOLOGY OF VISCERAL ORGANS OF THE VERTEBRATES</strong></td>
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<td><strong>Number of hours:</strong> 300 (30 hours lectures, 270 hours practise). Credits: 10.0.</td>
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| **General content:** Lectures: Comparative morphology of digestive system of fishes, amphibians, reptiles, birds and mammals. Comparative morphology of respiratory system of fishes, amphibians, reptiles, birds and mammals. Comparative morphology of urogenital system of fishes, amphibians, reptiles, birds and mammals.  
  Practice: Dissection and microscopic anatomy of the digestive system of fishes, amphibians, reptiles, birds and mammals. Dissection and microscopic anatomy of the respiratory system of fishes, amphibians, reptiles, birds and mammals. Dissection and microscopic anatomy of the urogenital system of fishes, amphibians, reptiles, birds and mammals. |
| **Development of general and specific competence (knowledge and skills):** Students will obtain knowledge about digestive, respiratory, genital and urinary system of the vertebrates. Students will understand evolution of that organs systems, and comparative morphology from fishes to mammals. It can be base for complete understanding of comparative biology, pathology and clinical appliance, and that knowledge is helpfull for fundamental understanding of vertebrates morphology. |

Evaluation of knowledge achievements: Oral exam

Manner of supervising the quality and performance of subject: Anonymous questionnaire of the students in every teaching year.

CURRICULUM VITAE OF THE PROFESSORS

| G16. | Hrvoje Lucić, Vesna Gjurčević Kantura: |
|      | COMPARATIVE MORPHOLOGY OF CIRCULATORY SYSTEM OF THE VERTEBRATES |

Number of hours: 100 (10 hours lectures, 90 hours of practice). Credits: 8,5.

General content: Lectures: Comparative morphology of circulatory system in fishes, amphibians, reptiles, birds and mammals.

Practice: Dissection of circulatory organs of the fishes, amphibians, reptiles, birds and mammals.

Development of general and specific competence (knowledge and skills): Students will obtain knowledge about circulatory system of the vertebrates, and will understand evolution of that system and its comparative morphology from fishes to mammals. It can be base for complete understanding of comparative biology, pathology and clinical appliance, and that knowledge is helpful for fundamental understanding of vertebrates morphology.


Literature for the attendants:

Evaluation of knowledge achievements: Oral exam

Manner of supervising the quality and performance of subject: Anonymous questionnaire of the students in every teaching year.

CURRICULUM VITAE OF THE PROFESSORS
G17. Hrvoje Lucić, Damir Mihelić
COMPARATIVE MORPHOLOGY OF THE NERVOUS SYSTEM AND THE SENSE ORGANS OF THE VERTEBRATES

Number of hours: 100 (10 hours lectures, 90 hours of practice). Credits: 9,0.

General content: Lectures: Comparative morphology of the nervous system in fishes, amphibians, reptiles, birds and mammals. Comparative morphology of sense organs in fishes, amphibians, reptiles, birds and mammals.

Practice: Dissection and microscopic anatomy of the neural system in the fishes, amphibians, reptiles, birds and mammals. Dissection and microscopic anatomy of the sense organs in the fishes, amphibians, reptiles, birds and mammals.

Development of general and specific competence (knowledge and skills): Students will obtain knowledge about neural system and sense organs of the vertebrates, and will understand evolution of that system and its comparative morphology from fishes to mammals. It can be base for complete understanding of comparative biology, pathology and clinical appliance, and that knowledge is helpful for fundamental understanding of vertebrates morphology.


Literature for the attendants:
J. Kolde: Srovnavači anatomie zvirat domácích se zretelem k anatomii člověka, I. Část obecná, II. Nauka o kostech a chrupavkách. Novina, Brno, 1936.

Evaluation of knowledge achievements: Oral exam

Manner of supervising the quality and performance of subject: Anonymous questionnaire of the students in every teaching year.

CURRICULUM VITAE OF THE PROFESSORS

G18. Snježana Kužir, Vesna Gjurčević-Kantura
COMPARATIVE MORPHOLOGY OF COMMON INTEGUMENT OF THE VERTEBRATES

Number of hours: 100 (10 hours lectures, 90 hours of practice). Credits: 6,5.

General content: Lectures: Comparative morphology of the common integument in the fishes, amphibians, reptiles, birds and mammals.

Practice: Dissection and microscopic anatomy of the neural system in the fishes, amphibians, reptiles, birds and mammals.

Development of general and specific competence (knowledge and skills): Students will obtain knowledge about common integument of the vertebrates, and will understand evolution of that system and
its comparative morphology from fishes to mammals. It can be base for compleite understanding of comparative biology, pathology and clinical appliance, and that knowledge is helpfull for fundamental understanding of vertebrates morphology.


**Literature for the attendants:**


**Evaluation of knowledge achievements:** Oral exam

**Manner of supervising the quality and performance of subject:** Anonymous questionnaire of the students in every teaching year.

**CURRICULUM VITAE OF THE PROFESSORS**

**Prof. dr. Vesna Gjurčević Kantura**

Department of Anatomy, Histology, and Embryology, Faculty of Veterinary Medicine, University of Zagreb, 10000 Zagreb, Heinzelova 55, Croatia

See course G1.

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**G19.** Alenka Tofant: WATERS IN VETERINARY PRACTICE – QUALITY AND TREATMENT

**Duration (in hours):** total 30 (lectures 9, practical 9, seminars 12). Credits: 4.0.

**Outline:** Lectures: Drinking water: organoleptic, physicochemical and microbiologic properties as safety criteria. Sources of drinking water contamination. Drinking water conditioning and disinfection. Health aspects of compounds present in drinking water; hydric infections. Surface waters: surface water quality relative to aquaculture. Interaction between the environment and aquaculture. Wastewater: physical parameters; chemical and biologic contamination of wastewater from animal origin food industries, knackeries and cattle breeding facilities. Primary and secondary wastewater processing. Liquid manure: hygienic aspects of its environmental impact and use in agriculture.


problems related to wastewater from veterinarian service. Survival of pathogenic microorganisms and parasites in wastewater from cattle breeding facilities. Ecologically acceptable liquid manure disinfection. **Development of general and specific competences (knowledge and skills):** The basic purpose of the subject is to educate students about different waters quality which are of interest for veterinary practice, specially in the field of preventive veterinary medicine (drinking water, water in food production area, waste water) acquiring the skills for their employment and treatment, all with the purpose of health care and environment protection.  

**Co - lecturers:** Professor Marija Vučemilo, Ph.D., Assist. Professor Željko Pavičić, Ph.D.

**Recommended literature:**  

**Examination:** written and oral examination.  

**Manner of supervising the quality and performance of subject:** Statut of University  

COURSE LEADER’ S CV  
Professor Alenka Tofant, Ph.D.  
Department of Animal Hygiene, Environment and Ethology, School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia, phone: +385 1 2390 293; fax: +385 1 2441 390; E-mail: alenkath@vef.hr  

Born in Zagreb in 1946. Education received in Zagrebu. Graduated from the School of Chemical Engineering, University of Zagreb; Department of Chemical Engineering (Chemistry – Inorganic Chemistry) in 1970; Master of Science degree at Postgraduate Studies in Biology (Molecular Biology), University of Zagreb in 1975; in 1991 defended doctoral dissertation at the School of Veterinary Medicine, University of Zagreb, in the field of medical sciences – veterinary medicine. In 1997 and 1998 attended seminars entitled European Union Guidelines for Ecotoxicologic Studies and Laboratory Structure According to HRN EN 45001. From 1973 till 1977 employed as a scientific associate at the Department of Pathophysiology, Institute of Physiology and Pathology of Animal Production, Faculty of Veterinary Medicine; in 1977 appointed scientific assistant. From 1983 till 1992 working as scientific/teacher assistant at Department of Zoohygiene; appointed Assistant Professor in 1992, Associate Professor in 1999, and Professor in 2003. Actively included as lecturer at undergraduate studies in Animal Hygiene, Environment and Ethology, and at postgraduate studies in Sanitation (Hygiene and Sanitation, Applied Disinfection). Member of the Croatian Society of Biochemistry, Croatian Society of Ecology, Croatian Society of Water and Sea Protection, International Society of Animal Hygiene, and Croatian Society of Microbiology – Section of Water Microbiology.  

**Selected publications:**  


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**G20.** Marija Vučemilo: VETERINARY SERVICE AND ENVIRONMENTAL PROTECTION

**Duration (in hours):** 30 (lectures 14, practical 8, seminars 8). Credits: 4.0.

**Outline:**
- Lectures: Liquid manure as environmental issue and vector of infectious diseases; Hygienic risks of animal waste (carcasses, offal, skin, wool, egg shells, liquid and solid manure, etc.); Dog feces as a problem of urban setting contamination; Collection, management and safe disposal of carcasses and offal; Biogas, composting, sludge management; Disposal and integral management of medical waste (infectious, toxic, radioactive); Management and disposal of chemical substances used in pest control (disinfectants, insecticides, rodenticides).

- Practical: Animal waste monitoring at a farm; Offal monitoring in slaughterhouse.

- Seminar: Development of a program for animal waste integral management; development of plan and program for integral management of pesticides used in pest control.

**Development of general and specific competences (knowledge and skills):** Attendants will acquire some knowledges and skills which are necessary to take during animal breeding and housing, during treatment and processing of animal provisions, carcasses and offal utilization and taking out DDD measurements in purpose of environmental protection.

**Co-lecturers:** Professor Alenka Tofant, Ph.D., Assist. Professor Željko Pavičić, Ph.D.

**Recommended literature:**

**Examination:** written and oral examination.
Manner of supervising the quality and performance of subject: Statut of University

COURSE LEADER’S CV
Professor Marija Vučemilo, Ph.D.
Department of Animal Hygiene, Ecology and Ethology, School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia, phone: +385 1 2390 291; E-mail: vučemilo@vef.hr

Born in Sinj in 1947. Education received in Sinj and Zagreb. Graduated from the School of Veterinary Medicine, University of Zagreb in 1971; M.S. degree in 1974, and doctoral degree in 1978. From 1972 till 1977 employed as a scientific associate at the Department of Zoohygiene, Institute of Physiology and Pathology of Animal Production. In 1977 appointed scientific assistant, in 1979 scientific associate, and in 1984 Assistant Professor on the subject of Zoohygiene; habilitation in 1985; appointed senior scientific associate in 1986; Associate Professor on the subject of Zoohygiene in 1989; Assistant Professor on the subject of Animal Hygiene, Ecology and Ethology in 1999; and Professor in 2004; assistant dean for educational issues in the academic years 1991-1992 and 1992-1993. Actively participating in undergraduate and postgraduate studies as well as in a number of scientific projects. Principal investigator in three scientific projects. Supervisor to one doctoral dissertation and 12 M.S. theses. Author to 15 papers published in tertiary periodicals (CC) and 47 scientific papers in journals cited in secondary publications. Actively participated in 21 international meetings with 30 reviewed papers and in 7 Croatian scientific meetings with 10 papers. Author to 24 invited lectures presented at Croatian meetings. Member of scientific or organizing committees, co-organizer or organizer of a number of Croatian meetings with international participation. Member of the Society of Animal Hygiene, Croatian Society of Ecology, Croatian Society of Water and Sea Protection, and Croatian Society of Microbiology – Section of Water Microbiology.

Selected publications:
G21. Marija Vučemilo:
AIR HYGIENE IN STOCK HOUSING

Duration (in hours): total 30 (lectures 14, practical 8, seminars 8). Credits: 3.5.

Outline: Lectures: Adverse substances in the air of stock housing accommodating large animal number; Origin and types of dust in stock housing; Dust as carrier of bad odor (particle size, inhalant); Pathogenic bacteria in the air and their survival depending on temperature-humidity ratio; Bioaerosol in stock housing air (origin, types, effect on animals); Adverse gases in the air of stock housing and their effect on animal health and production (types, origin); Emission of adverse gases, microorganisms and dust from stock housing to the environment.

Practical: Air sampling for identification of microorganisms, dust and adverse gases in stock housing air; Determination of microclimate complex.

Seminar: Assessment of air hygienic quality in housings accommodating particular domestic animal species and categories.

Development of general and specific competences (knowledge and skills): Attendants will acquire some knowledges and skills about hygienic air quality in animal housing what is very important for health and animal production.

Co-lecturers: Professor Alenka Tofant, Ph.D., Assist. Professor Željko Pavičić, Ph.D.

Recommended literature:

Examination: written and oral examination.

Manner of supervising the quality and performance of subject: Statut of University

COURSE LEADER’S CV
Professor Marija Vučemilo, Ph.D.
Department of Animal Hygiene, Ecology and Ethology, School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia, phone: +385 1 2390 291; E-mail: vucemilo@vef.hr
See course G20.

Selected publications:
G22. Marija Vučemilo:
SANITATION MEASURES IN STOCK PRODUCTION

Duration (in hours): total 30 (lectures 14, practical 8, seminar 8). Credits: 3,5.

Outline:
- Lectures: Role of sanitation in the prevention, control and eradication of infectious diseases; Zoonosis control and veterinary public health; A new integral approach to insect and murine rodent control in stock breeding; Insecticides, acaricides and rodenticides – resistance and environmental impact; Alternative methods in pest control in stock breeding; Hygienic aspects of animal food manufacture; Implementation of HACCP system in food manufacture.

Practical: Microorganism, harmful insect and rodent control at farms, slaughterhouses, and plants for manufacture and storage of food of animal origin.

Seminars: Development of HACCP system for particular farm types, slaughterhouse, and plants for manufacture and storage of food of animal origin.

Development of general and specific competences (knowledge and skills): Attendants will acquire some knowledges and skills about hygienic measures which are necessary to take during animal housing and which are very important for health and animal production.

Co-lecturers: Professor Alenka Tofant, Ph.D., Assist. Professor Željko Pavičić, Ph.D.

Recommended literature:

Examination: written and oral examination.

Manner of supervising the quality and performance of subject: Statut of University

COURSE LEADER’S CV

Professor Marija Vučemilo, Ph.D.
Department of Animal Hygiene, Ecology and Ethology, School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia, phone: +385 1 2390 291; E-mail: vucemilo@vef.hr

See course G20.
Selected publications:


G23. Željko Pavičić:

VEGETARY ACTIVITES IN STABLE PROJECTING

Duration (in hours): Total of 30 (14 of lectures, 8 of seminars, 8 of practical work). Credits: 4,0.

Outline: Lectures: Role of veterinary activities in stable projecting; Particularities of different stable types important for animal health condition and production; Organization, projecting and legislative regulations regarding stable construction; Geologic-hydrological influence of the ground on stable construction; Stable constructional elements; Biological-technological conditions of environment; Discomfort index; Production and heat spending factors in stable; Stable dimension and construction factors; Role of contemporary equipment to animal welfare; Rational use of water and energy in stable housing of animals.

Seminars: A future stable size determination in cattle-, pig-, sheep-, goat-, poultry- and rabbit-breeding regarding the given normative (prescribed number of animals in intensive production, way of housing, way of using animals etc.)

Practical work: Monitoring of basic bioclimatic factors in stable (quality of fresh air in m³/h per conditional head; calculation of heat transfer coefficient kcal/m² h°C); Testing of ventilator effects in stable.

Development of general and specific competences (knowledge and skills): After completed colegium veterinarians will aquire basic knowledges in planning stables and in that way will be capable for designing contemporary objects for keeping animals with respect to animal wellfare and production.

Co - lecturers: Prof. dr. sc. Marija Vučemilo, Prof. dr. sc. Boris Krsnik, Prof. dr. sc. Alenka Tofant

Recommended literature:


77
Manner of supervising the quality and performance of subject: Statut of University

Examination: Oral exam

COURSE LEADER’S CV

Doc. dr. sc. Željko Pavičić
Department for Animal hygiene, environment and ethology, Veterinary Faculty, Heinzelova 55, 10000 Zagreb, tel. 2390 295, E-mail: zpavicic@vef.hr

Born in Zagreb in 1967, married, father of four children. In 1992 graduated at Zagreb Veterinary Faculty, in 1994 at Križevci Agricultural Institute and in 1998 at Osijek Agricultural College. In 1994 won a master’s degree in a research postgraduate study – Animal hygiene, environment and ethology, and in 1995 won a master’s degree in a specialized postgraduate study – Health care of pigs at Zagreb Veterinary Faculty. In 1997 doctorated at Department for Animal hygiene, environment and ethology of Zagreb Veterinary Faculty. During 1995 employed as a junior researcher at Zagreb veterinary Faculty. In 1996 promoted into research profession of the assistant, during 1997 into research profession of the senior assistant, and finally in 1999 into lecturer profession of the senior assistant lecturer. In 2001 was habilitated and was promoted into scientific-instructional profession of assistant professor at Department for Animal hygiene, environment and ethology of Zagreb Veterinary Faculty. The specific domain of his scientific papers is Animal hygiene – housing and sanitization, as well as clinical ethology. Takes part in pre and postgraduate lectures, as well as in scientific projects. A member of Croatian veterinary society and Croatian dairy association. Independently and as a co-author published one university textbook, one faculty textbook, two high-school students’ books, two veterinary school teacher’s books, nine scientific papers in CC publication, eighteen scientific papers in secondary publication, seventeen scientific papers in proceedings of international and inland meetings, four invited lectures at international and inland meetings, four expert books, eighteen expert papers and more than 250 expertly-popularizing articles in greatly appreciated Croatian agricultural magazines.

Selected publications:


Selected publications:

G24. Željko Pavičić:
ECOLOGICAL PRODUCTION IN CATTLE BREEDING
Duration (in hours): Total of 45 (20 of lectures, 15 of seminars, 10 of practical work). Credits: 4,5.

Outline: Lectures: Meaning and benefit of farm animals breeding in ecologically favourable way; Normative laws which regulate ecological stock breeding in Europe and Croatia; Characteristics and choice of farm animal breeds for the ecological production; Supervision of animals in ecological production; Housing conditions of particular animal species in ecological production; Feeding of animals; Zoo technical interventions of animals in ecological production; Animal health care; Transport and butchering of animals.

Seminars: Sanitary devices and their uses in the stable hygiene and care of animals; Alternative methods in cure of animals in ecological production.

Practical work: Monitoring of animal health in ecological production; Observation of bioclimatic conditions in stables and animal housing conditions in ecological production; Appliance of disinfection devices in udder hygiene of cud-chewers in ecological production.

Development of general and specific competences (knowledge and skills): Our country has large possibilities for cattle breeding the ecological way, mostly because tipical geographical layout, climatic diversities, clean environment and quality meadows. Because of that we can produce food of animal origin with ecological auspice not only for ourselves, but for foreign markets too. But when we discuss ecological cattle breeding, important part in that is veterinarian profession. That’s why, through this collegium will be acquired knowledges about zootechnical measures, methods of health care and healing of animals in ecological production, and veterinary sanitary surveillance and rest factors of ecological cattle breeding in wich is indispensable cooperation with veerinarian experts.

Co-lecturers: Prof. dr. sc. Marija Vučemilo, Prof. dr. sc. Alenka Tofant, Prof. dr. sc. Velimir Sušić, Prof. dr. sc Željko Mikulec

Recommended literature:

** Pravilnik o ekološkoj proizvodnji životinjskih proizvoda (NN 13/2002)

Manner of supervising the quality and performance of subject: Statut of University

Examination: Oral exam

COURSE LEADER’S CV
Doc. dr. sc. Željko Pavičić
Department for Animal hygiene, environment and ethology, Veterinary Faculty, Heinzelova 55, 10000 Zagreb, tel. 2390 295, E-mail: zpavicion@vef.hr
See course G23.

Selected publications:

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The basic purpose of this subject is to introduce the students to the concept of the relationship between the organism, the environment (sinecology) and the health of the animal, acquiring the skills and conquering the monitoring techniques and the execution of the record files regarding the animals and the environment as well as the possibility to enable them as for the scientific research so for the practical application.
Recommended literature:


Examination: Oral

Manner of supervising the quality and performance of subject: Students' poll

COURSE LEADER'S CV

G26. Marija Vučemilo, Željko Pavičić:
COMPARATIVE TECHNOLOGIES IN LIVESTOCK INDUSTRY

Duration (in hrs): 30 (14 lectures, 8 practical exercises, 8 seminars). Credits: 3,5.

Outline: Lectures: Livestock industry; use of sophisticated techniques; advantages and disadvantages of this type of livestock husbandry; role of veterinarians relative to zooprophylactic conditions; issues of human health and environmental protection when animal health depends on permanent medication. Sustainable cattle breeding; animal management; multifunctional role of family farms; ecosocial documented production conditions; achievement of high quality animal production.

Exercises: Monitoring of intensive cattle breeding effects on the environment and animal health; monitoring of the effects of family farm cattle breeding on the environment, animal health and productivity.

Seminars: Assessment of the impact of different livestock industry technologies on practical agricultural effects; introduction of veterinary solutions in the legislature corresponding to eco-market economy.

Development of general and specific competences (knowledge and skills): Attendants will acquire some knowledges and skills about comparative technologies of animal production, and how these technologies have an effect on animal health and their producion.

Co-lectures: Professor Marija Vučemilo, Ph.D., Kristina Matković, M.S.

Recommended literature:


Manner of supervising the quality and performance of subject: Knowledge will be testing by conversation during seminars and practices, and finally on exam.

Examination: written and oral examination.

COURSE LEADER'S CV

G27. Željka Matašin:
BEE BIOLOGY (SYSTEMATIZATION, ANATOMY AND PHYSIOLOGY, ETHOLOGY AND ACTIVITIES OF BEES)
Total hours: 85 (lectures 60, practical work 25). Credits: 8,0.

Outline: Evolution of social insects, Systematic position of Apis gender, Species of European Honey Bee, Bee Community and its Members (the queen bee, worker bees and drones), Anatomy and Physiology of bee organ systems (body structure, organs of movement, digestive system, circulatory system, respiratory system, excretory system, reproductive system and reproduction, nervous system, sensory system, glands), Bee Brood and Reproduction, Short- and Long-lived Bees, Order of Activities in a Bee's Life, Acquiring Reflexes, House Bee Tasks, Collector Bee Tasks, Queen Bee Activities, Role of Drones, Communication among Bees, Bee Swarming, Bee Community without a Queen Bee, Bee Wintering.

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific work in bee biology

Teaching assistants: Prof. Zdravko Petrinec, V.M.D.

Recommended literature:

Examination: Oral

Manner of supervising the quality and performance of subject: students questionnaire.

CURRICULUM VITAE OF THE MENTOR
Željka Matašin, DVM, PhD, Assistant Professor
Department for Fish and Bees Biology and Pathology, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb

Born in Zagreb in 1949, graduated from the Faculty of Veterinary Medicine in Zagreb in 1977. She defended the thesis under the title: “Inactivated vaccine used for carp vaccination against spring viremia” in 1988. From 1978 worked on the Faculty of Veterinary Medicine in Zagreb, at Department for Biology and Pathology of Fish and Bees. Member of the teaching staff at undergraduate studies: Fish Biology and Pathology, elective subject: Fish farming and Selected Chapters from Aquaculture, and postgraduate studies in Ichthyopathology, Biology and Pathology of Bees, and Microbiology. She was a part-time lecturer for 10 years, since the establishment of the Veterinary School in Zagreb, teaching Parasitology and Invasive Diseases of Domestic Animals in the first year, and then Biology and Pathology of Fish and Biology and Pathology of Bees. In the frames of advanced training, she participated in the International Seminar of Fish Pathogens and Environment in European Polyculture, held in Szarvas, Hungary. In 1983, she worked as a young researcher at the Laboratory for Viral Fish Diseases at the Institute of Zoology and Hydrobiology of the Munich University, in the frames of inter-university exchange of scientists between the Zagreb University and the “Ludvig Maximillian” University from Munich. In 1995, she again visited and worked at the same laboratory. Based on acquired experience, she introduced scientific-research procedures from the field of infectious and parasitic diseases of fish, other aquatic organisms and bees into the microbiological, and particularly virological laboratory of the Department for Biology and Pathology of Fish and Bees. She also successfully managed the laboratory diagnostics, as confirmed by her fruitful cooperation with a number of staff-members and residents from the country and from abroad. As a staff member, she actively participated in realization of four scientific research projects and successfully participated in the field diagnostics of fish diseases and other forms of collaboration of the Department’s staff-members, particularly those based on contractual co-operation with business organisations. In 1988, as a representative of the Yugoslav Chamber of Economy and a member of the Yugoslav delegation to the CMEA’s Committee for Agroindustry, she officially represented Yugoslavia and signed the Protocol on
Co-operation at the meeting of CMEA (Council of Mutual Economic Assistance) in the Czech Budjejovice. She was a member of organizational committees of expert symposia and meetings, on editorial boards of professional journals, and as a student she was the editor-in-chief and executive editor of the journal “SSVMJ Veterinar”. She held numerous seminars and public lectures for veterinary inspectors, doctors of veterinary medicine, beekeepers, fishermen and other groups interested in biology and pathology of fish and bees. She was the mentor in two doctoral and one master’s thesis, as well as the analyst for several students’ papers and degree reports. She chaired or was a member of a number of expert committees responsible for evaluation, giving opinions, defending degree reports or acquiring masters and doctoral degrees, or the scientific-research profession. She is a member of several domestic and international associations of experts. She was awarded the Medallion and an award for contribution and advancement of Croatian bee-keeping, recognitions for collaboration in the journal “Hrvatska pčela” (Croatian Bee) and Scroll of Honour for long-year co-operation with a bee-keeping company.

Selected papers:


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<th>G28.</th>
<th>Željka Matašin</th>
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<td>BEE BREEDING, BEE PRODUCTS AND APITHERAPY</td>
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**Total hours**: 45 (lectures 30, practical work 15). **Credits**: 4.5.

**Outline**: Natural Habitat and Fixed-comb Hives; Types of Beehives with Moveable Combs; Bee-keeping Equipment and Tools; Apiary, Arrangement and Position, Bee Community Overview, Work in the Apiary (nutrition reinforcement, uniting of colonies, swarming, activities in spring, before main bee pasture, before and during wintering); Rearing of Queen Bees; Genetics, Selection and Hybridization of Bees; Production, Checking Characteristics and Queen Bee Transport; Artificial Insemination of Queen Bees, Transfer to Pasture; Fruit and Industrial Plants Pollination; Intensive Production of Apiary Products (hones, pollen, propolis, wax, royal jelly, bee venom), Apitherapy.

**Development of general and specific competences (knowledge and skills)**: Students will be qualified for scientific work in bee breeding, bee products and apitherapy

**Teaching assistants**: Prof. Zdravko Petrinec, V.M.D., Prof. Ivica Valpotić, V.M.D., Assistant Professor Maja Popović, V.M.D.

**Recommended literature**:


Examination: oral

Manner of supervising the quality and performance of subject: students questionnaire.

CURRICULUM VITAE OF THE MENTOR
Željka Matašin, DVM, PhD, Assistant Professor
Department for Fish and Bees Biology and Pathology, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb
See course G27.

Selected papers:

G29. Željka Matašin:
EPIZOOTIOLOGY, PROPHYLAXIS AND TREATMENT OF BEE DISEASES

Total hours: 70 (lectures 50, practical work 20). Credits: 7,0.
Outline: Sources of Bee Infections, Spreading Routes (transmission of pathogens among bee colonies and inside bee colonies, factors affecting susceptibility of colonies to disease); General Prophylactical Measures (position of apiary, beehive characteristics, sanitary watering places, preventive measures for work with bee colonies; Drug Application Methods (by vaporization, smoking, contact and feeding).

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific work in bee diseases

Teaching assistants: Prof.dr.sc. Željko Župančić, Prof. Zdravko Petrinec, V.M.D.

Recommended literature:

Examination: oral.

Manner of supervising the quality and performance of subject: students questionnaire.

CURRICULUM VITAE OF THE MENTOR
Željka Matašin, DVM, PhD, Assistant Professor
Department for Fish and Bees Biology and Pathology, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb

See course G27.

Selected papers:


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G30. Ivana Tlak Gajger:

INFECTIOUS BEE DISEASES

Total hours: 170 (lectures 110, practical work 60). Credits: 10,0.

Outline: Sequence in Description of Infectious Diseases (definition, spread, incidence, significance, etiology, epizootiology, pathogenesis, symptoms, pathological changes, consequences affecting bee colony, diagnostics, differential diagnostics, prevention and control); Well-known Viral Diseases (sack brood disease, chronic paralysis, acute paralysis, slow paralysis, black queen cell disease, cloudy wings disease, bee pupa disease); Less Known Viral Diseases; Study Methods of Viral Diseases (cell cultures of insects and viral multiplication in larvae and adult bees, purification of bee viruses, immunological methods, biological tests, pathohistology); Bacterial Bee Diseases (American foulbrood, European fouldbrood, septicaemias); Bacterial Flora of Bee Colony; Study Methods of Bacterial Bee Diseases (breeding places, bacteria isolation and identification, immunological methods); Bacteria-Host Relationship; Chemotherapy of Bacterial Diseases; Study Methods of Fungal Bee Diseases (breeding places, isolation and identification of fungi); Relationship of Bacteria and Fungi; Factors in Favour of Fungal Diseases; Bee Diseases Caused by Fungi (Ascopherosis, aspergilosis, melanosis, pollen mouldiness), Control and Treatment of Fungal Bee Diseases.

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific work in bee diseases in microbiological bee laboratories

Teaching assistants: Prof. Tomo Naglić, V.M.D., Assistant Professor Željka Matašin, V.M.D.

Recommended literature:

Examination: oral.

Manner of supervising the quality and performance of subject: students questionnaire.

CURRICULUM VITAE OF THE MENTOR

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<th>G31.</th>
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<td>PARASITIC BEE DISEASES</td>
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Total hours: 100 (lectures 70, practical work 30). Credits: 9.0.

Outline: Bee Diseases Caused by Protozoa (amebosis, nosemosis, gregarine, flagellates), Bee Diseases Cause by Mites (acarosis, varoosis, tropilaelaps) Prevention, Control and Treatment of Parasitoses.

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific research in parasitic diseases, prevention and therapy methods

Teaching assistants: Assistant Professor Tatjana Živićnjak, V.M.D., Prof. Zdravko Petrinec, V.M.D.,

Recommended literature:

Examination: oral.

Manner of supervising the quality and performance of subject: students questionnaire.

CURRICULUM VITAE OF THE MENTOR

Željka Matašin, DVM, PhD, Assistant Professor
Department for Fish and Bees Biology and Pathology, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb

See course G27.

Selected papers:

G32. Ivana Tlak Gajger:
NON-INFECTIONS BEE DISEASES, POISONING AND PESTS

Total hours: 80 (lectures 60, practical work 20). Credits: 6,5.
Outline: Temperature-related Diseases and Deaths; Effect of Unsuitable Food and Lack of Certain Nutrients on Bee Community Health and Development, Pollen-induced Constipation, Poisoning (honey-dew, nectar, pollen, table salt); Poisoning Caused by Environmental Impurities, Poisoning with Pesticides (symptoms of poisoning in front of the hive and in the hive, taking of samples, diagnostics, procedure in case of bee colony poisoning, preventive measures, help to bee colony); Vertebrates as Bee Enemies (bears, birds, mice, oil-beetle larva, parasitic flies (braula), moths (greater and lesser wax moth, pollen moth, Death's Head Hawk Moth); wasps and hornets, insects (ants, praying mantis, earwigs, larder bee).

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific research in parasitic diseases, prevention and therapy methods

Teaching assistants: Prof. Emil Srebočan, V.M.D., Assistant Professor Željka Matašin, V.M.D.

Recommended literature:

Examination: oral.

Manner of supervising the quality and performance of subject: students questionnaire.

CURRICULUM VITAE OF THE MENTOR

G33. Marko Tadić:
STATISTICS

Duration (in hrs): 50 (20 hours of lectures, 30 hours of labs). Credits: 5,5.
Outline: Sample planing, theoretical distributions, hypothesis testing, univariant and multivariant variance analysis, discriminatory analysis, simple, partial and multiple correlation and regression, time series analysis, indices, trends, forecasting, nonparametrical statistics, decision making analysis.
Labs: Problem solving, use of statistical software

Development of general and specific competences (knowledge and skills): Students are trained to apply statistical methods in the fields of epidemiology and economic research as well as to interpret statistical data in scientific literature.

Co-lecturers: Velimir Sušić, PhD., Denis Cvitković, Msc.
Recommended literature:

Examination: oral and written

Manner of supervising the quality and performance of subject: Statut of University

COURSE LEDERS CV

Prof.dr.sc. Marko Tadić
Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, tel. ++ 385 1 23 90 130, fax. ++ 385 1 24 41 390, e-mail: marko.tadic@zg.htnet.hr

Born in 1946. Graduated from the Veterinary Faculty, University of Zagreb in 1970. Appointed an assistant at the same Faculty in 1970 for the Animal Husbandry Economics course. In 1976 he was awarded a PhD at the Faculty of Agriculture, University of Zagreb in the field of agricultural economics. He was appointed a full professor in 1986. As a full professor he teaches also at the Veterinary Faculty, University of Ljubljana, and the Veterinary Faculty, University of Sarajevo. Was a head of University of Mostar. Was a government official in Republic of Croatia, Federation of Bosnia and Herzegovina, and Republic of Bosnia and Herzegovina. As an author or co-author he published more than 200 papers. Is a member of Croatian Agrieconomic Society, Croatian Sociological Society, and the International Society for Veterinary Epidemiology and Economics.

Selected publications:

Tadić, Marko; Ante, Dean; Vera, Tadić. Utjecaj troškova lijekova na ekonomiku proizvodnje u pojedinim granama stočarstva (odnosi cijena lijekova, stole i stočnih proizvoda). Praxis veterinaria 32, 1984, 4-6, 215-229, Sažetak.

G34. Marina Pavlak
VETERINARY RISK ANALYSIS

Duration (in hrs): 50 ( 10 lecture hours, 20 hours of labs, 20 hours of seminars). Credits: 6,0.

Outline:Lectures: Theoretical basis of Risk Analysis, risk identification, risk assesment principles, risk assesment processes, risk management principles, components of risk management, principles of risk communication, risk analysis and application of epidemiological methods, quantitative risk assesment and application of statistical methods, decision analysis and risk analysis, veterinary risk analysis appiculation experiences, risk analysis application restrictions, standard O.I.E. methodology
Labs: real world problem solving, application of statistical and epidemiological methods un risk analysis.
Seminars: Risk analysis and International trade with animals and animal products.

**Development of general and specific competences (knowledge and skills):** Students are trained to apply different risk assessment methods especially in the international trade with animals and animal origin products.

**Co-lecturers:** Mr. sc. Josip Šimičić, Sanja Šeparović, dr.vet.med.

**Recommended literature:**
V. Caporale, A. Giovannini, P. Calistri, A. Conte: Import risk analysis: the experience of Italy. O.I.E. 1999; 18; 729-740.
T. Jick: Mixing Qualitative and Quantitative Methods: Triangulation in Action. Administrative Science Quarterly. 1979; 24; 602-611.

**Examination:** oral and written

**Manner of supervising the quality and performance of subject:** Statut of University

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### G35. Marko Tadić
**EUROPEAN VETERINARY STANDARDS AND REGULATIONS**

**Duration (in hrs):** 20 (20 lecture hours). Credits: 3.0.

**Outline:** Foundation and development of European Union, legislative practice and principles, acts' structure, veterinary standards and acts, acts on animal health protection and disease control, acts on veterinary public health, acts on hygienic and health status of animal products and their quality, recommendations and standards of international organizations FAO, WHO, O.I.E., Codex alimentarius, Croatian veterinary acts, acts on animal welfare, acts on food safety, compatibility of Croatian veterinary acts with those of European Union and international standards and recommendations.

**Development of general and specific competences (knowledge and skills):** Students obtain general knowledge on European Union and specific knowledge on its veterinary standards and regulations as well as on the standards and regulations of important international organizations as FAO, O.I.E., WHO and Codex alimentarius.

**Co-lecturers:** Prof. dr. sc. Marko Tadić, doc. dr. sc. Petar Đžaja, Sanja Šeparović, dr. vet. med.

**Recommended literature:**
Zakonodavstvo Europske unije ([www.eurolex.com](http://www.eurolex.com))
Zakonodavstvo Republike Hrvatske (Narodne novine)
FAO-dokumentacije
O.I.E. publikacije

**Examination:** oral

**Manner of supervising the quality and performance of subject:** Statut of University

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### G36. Marko Tadić
**ANIMAL HEALTH AND FOOD SAFETY IN INTERNATIONAL TRADE**

**Duration (in hrs):** 20 (20 hours of lectures). Credits: 3.0.

**Outline:** Quantity, tendencies and flow of animals and products of animal origin in international trade,
specific traits of this trade, international contracts and agreements on animal trade, the role of international organizations O.I.E., FAO, WHO, Codex alimentarius, EU, the most important infectious diseases in international trade, zoonoses in international trade, food borne diseases and international trade, animal welfare and international trade, the use of risk analysis, veterinary service evaluation and international trade

**Development of general and specific competences (knowledge and skills):** Students are trained to apply domestic and international veterinary regulations and standards in international trade with animals and animal origin products.

**Co-lecturers:** Prof. dr. sc. Marko Tadić, Prof. dr. sc. Berislav Jukić, Sanja Šeperović, dr. vet. med., mr. sc. Denis Cvitković

**Recommended literature:**
- Zakonodavstvo Europske unije (www.eurolex.com)
- Zakonodavstvo Republike Hrvatske (Narodne novine)
- FAO-dokumentacije
- O.I.E. publikacije

**Examination:** oral

**Manner of supervising the quality and performance of subject:** Statut of University

**COURSE LEDERS CV**

**Prof.dr.sc. Marko Tadić**
Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, tel. ++ 385 1 23 90 130, fax. ++ 385 1 24 41 390, e-mail: marko.tadic@zg.htnet.hr

See course G33.

**Selected publications:**
- Tadić, Marko; Ante, Dean; Vera, Tadić. Utjecaj troškova lijekova na ekonomiku proizvodnje u pojedinim granama stočarstva (odnosi cijena lijekova, stoke i stočnih proizvoda). Praxis veterinaria 32, 1984, 4-6, 215-229. Sažetak.

Labs: Application of different loss assessment methods for some diseases.

**Development of general and specific competences (knowledge and skills):** Students are trained to independently apply complex loss assessment methods either for one or a group of diseases on the economy and state level.

**Co-lecturers:** Mr sc. Denis Cvitković, Radmila Raguž-Durić, dipl. inž.

**Recommended literature:**


**Examination:** oral.

**Manner of supervising the quality and performance of subject:** Statut of University

**COURSE LEDERS CV**

Prof.dr.sc. Marko Tadić
Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, tel. ++ 385 1 23 90 130, fax. ++ 385 1 24 41 390, e-mail: marko.tadic@zg.htnet.hr

See course G33.

**Selected publications:**

Tadić, Marko; Ante, Dean; Vera, Tadić. Utjecaj troškova lijekova na ekonomiku proizvodnje u pojedinim granama stočarstva (odnosi cijena lijekova, stoke i stočnih proizvoda). Praxis veterinaria 32, 1984, 4-6, 215-229, Sažetak.
G38. Marina Pavlak
ANIMAL HEALTH PROTECTION PROGRAMMING

Duration (in hrs): 70 (30 hours of lectures, 40 hours of seminars). Credits: 5.5.

Outline: Lectures: Economic meaning of disease, mathematical models in animal health economics, mathematical models in animal replacement decision making, static and dynamic models, deterministic and stochastic models, herd-, farm- and state-level health protection programming, partial budgeting, cost-benefit analysis, decision tree analysis, Markov chain, dynamic programming, Monte Carlo simulation and expert system application possibilities in animal health programming and economic justification evaluation of the program.

Seminars: Foot and mouth disease, classical swine fever, bovine tuberculosis, bovine and sheep brucelosis control programming.

Development of general and specific competences (knowledge and skills): Students acquire knowledge necessary for animal disease control programming on the herd, farm, county and the broader community level.

Co-lecturers: Mr. sc. Denis Cvitković, Sanja Šeparović, dr. vet. med., mr. sc. Josip Šimičić, Darko Čobanov, dr. vet. med.

Recommended literature:

Examination: oral.

Manner of supervising the quality and performance of subject: Statut of University

COURSE LEDERS CV

G39. Denis Cvitković
VETERINARY PRACTICE MANAGEMENT

Duration (in hrs): 30 (30 hours of lectures). Credits: 4.0.

Outline: Lectures: Introduction to management; management of clients, employees, invetory and equipment; financial aspects of management, funding, buying, and selling of the practice, management and professional mistakes; veterinary practice and legislation; patients, clients and veterinary staff; practice and staff protection; price making and fee colecting, services marketing, veterinary practice marketing , professional marketing, computer usage in veterinary practice.

Development of general and specific competences (knowledge and skills): Students are trained to manage and lead the veterinary practice as well as to apply contemporary marketing methods.

Co-lecturers: Prof. dr. sc. Milan Pogačnik

Recommended literature:

Examination: oral.
Manner of supervising the quality and performance of subject: Statut of University

COURSE LEDERS CV

G40. Marina Pavlak
ANALITICAL EPIDEMIOLOGY AND MODELLING

Duration (in hrs): 60 (30 hours of lectures, 10 hours of labs, 20 hours of seminars). Credits: 4,5.

Outline: Lectures: Position of epidemiology in disease research, epidemiological definition of the sample, classification processes, frequency measurement; causality; epidemiological research organization; experimental research; analytical epidemiology; determination of sample size application; confounding with one risk factor; confounding with more risk factors; interaction - modification and synergism; contingency factors control; matching; field research of the disease; modelling and simulation in epidemiology; epidemiological time series analysis; logistic regression; survival analysis; Markov chains; stochastic disease simulation.

Labs: epidemiological tasks solving, field work.

Seminars: simulation models application

Development of general and specific competences (knowledge and skills): Students are trained to organize and conduct interdisciplinary epidemiological research as well as to apply complex statistical methods and simulation techniques.

Co-lecturers: Mr. sc. Josip Šimić, mr. sc. Denis Cvitković, Sanja Šparović, dr. vet. med.

Recommended literature:

Examination: Oral and written.

Manner of supervising the quality and performance of subject: Statut of University

COURSE LEDERS CV

G41. Denis Cvitković
ANIMAL HEALTH ECONOMICS

Duration (in hrs): 70 (30 hours of lectures, 40 hours of seminars). Credits: 5,5.

Outline: Lectures: Veterinary activities organization – animal health protection, reproduction, veterinary-sanitary control, introduction to economics, demand and supply of veterinary services, demand and supply elasticity, consumer behaviour theory, service extension (delivery) factors, production theory, cost theory, economic efficiency, decision making analysis, veterinary services economics, veterinary services impact on animal husbandry production economics, animal health and production control organization.

Seminars: Herd health and production

Development of general and specific competences (knowledge and skills): Students are trained to apply economic methods on the organization and conduct of animal health protection.

Co-lecturers: Mr. sc. Denis Cvitković

Recommended literature:
G42. Zvonko Stojević:
PHYSIOLOGY OF DIGESTION IN RUMINANTS

**Duration (in hrs):** Totally 20 (12 hours lecturing, 4 hours practical work, 4 hours seminars). Credits: 3.5.


**Development of general and specific competences (knowledge and skills):** The aim is get to know students with physiology of digestion in ruminants. Student's investigations will be useful in scientific investigations. Acquiring a new knowledge and skills.

**Recommended literature:**
- Blecha, F., B. Charley (Eds.): Immunomodulation in domestic food animals. 1990.

**Examination:** oral

**Manner of supervising the quality and performance of subject:** Student's inquiry.

**COURSE LEADER'S CV**

Zvonko Stojević, Ph.D. Professor
Department of Physiology and Radiobiology, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, 10 000 Zagreb, Croatia, Phone: +385 1 2390 172; Fax: +385 1 2441 390; E-mail: stojovic@vef.hr

Was born at 19 of august 1955. in Dugo Selo. Education: primary school, high school and Veterinary faculty finished in Zagreb. Graduated from the university in 1980. Postgraduate and doctoral thesis finished at Veterinary faculty. Currently: assistant professor at Department of physiology Veterinary faculty University of Zagreb. Research interests: physiology of digestion in poligastric animals, physiology of stress and its impact on mineral metabolism and osteoporosis development.

**Selected publications:**
G43. **Zvonko Stojević: PHYSIOLOGY OF NEUROENDOCRINE SYSTEM IN DOMESTIC ANIMALS**

**Duration (in hrs):** Totally 20 (12 hours lecturing, 4 hours practical work, 4 hours seminars). Credits: 3,5.


**Development of general and specific competences (knowledge and skills):** The aim is to know students with physiology of neuroendocrine system. Student's investigations will be useful in scientific investigations. Acquiring a new knowledge and skills.

**Recommended literature:**

**Examination:** oral

**Manner of supervising the quality and performance of subject:** Student's inquiry.

**COURSE LEADER'S CV**

**Zvonko Stojević, Ph.D. Professor**
See course G42.

Selected publications:


diagnostic data with the purpose of diagnose, therapy and prognosis of disease. Also, they will be skilled to prepare the blood microscopic films and to get acquainted with cytological and cythochemical techniques.

**Co-lecturers:** Suzana Milinković-Tur, PhD, DVM, Terezija Silvija Marenjak MsC, DVM.

**Recommended literature:**
- Laboratorijska hematologija, atlas analize razmaza priferne krvi, Chronolab, Vision group. Nastavni CD.

**Examination:** Written and oral exams

**Manner of supervising the quality and performance of subject:** By the basis of students questioner.

**COURSE LEADER'S CV**
Nina Poljičak-Milas, PhD, DVM
*Department of pathophysiology, Faculty of Veterinary Medicine University of Zagreb, Heinzelova 55, Zagreb, Croatia, phone: +385 1 2390182, fax: +385 1 2390284, e-mail: nmilan@vef.hr.*

She was born 1961 in Zagreb, Croatia. Primary and secondary school finished in Zagreb, Croatia. She was graduated at the Faculty of Veterinary Medicine University of Zagreb in 1986. MSc degree obtained in 1991 at University of Zagreb Faculty of Science, Biology, Molecular and Cell Biology. PhD degree obtained 1999 at the Faculty of Veterinary Medicine University of Zagreb. She was employed as a young scientist (1987-1995), research assistant (1996-2003) and from 2004 as a senior lecturer at Department of Pathophysiology, Faculty of Veterinary Medicine University of Zagreb. From 1987 she participates in tutorial, lecturing program and scientific investigation in the Department of Pathophysiology, Faculty of Veterinary Medicine University of Zagreb. In 2000 she spent a training course in cytological laboratory of Hospital Clinic Merkur, Zagreb, Croatia. From 2002 she was a principal investigator of scientific project financed from Ministry of Science Republic of Croatia. She is member of Croatian Physiology Society and Croatian Veterinary Society.

**Selected publications:**
- Poljičak-Milas, Nina, A. Slavica, Z. Janicki, Mirna Robić, Maja Belić and Suzana Milinković-Tur: Serum biochemical values in fallow deer (Dama dama L.) from different habitats in Croatia. Z. Jagdwiss. 50, 7-12, 2004.
**PHYSIOLOGY OF EXCRETION, SELECTED CHAPTER**

**Duration (in hrs):** Total 10 (6 lectures, 2 tutorials and 2 seminars). Credits: 3.0.

**Outline:** Lectures: Electrolyte homeostasis, potassium channels, atrial natriuretic factor, hypertony of kidney medulla, blood pressure regulation: rennin-angiotensin-aldosterone system, tubular secretion and reabsorption and specific sites of toxin damaging


Seminars: kidney insufficiency, dialysis

**Development of general and specific competences (knowledge and skills):** Students are winning further knowledge of physiological renal function, especially in renal blood pressure regulation and electrolyte homeostasis. They will get acquainted with pathologic processes during the renal disease, starting with molecular, cellular and tissue disturbances, and finally, the whole organ dysfunction will be discussed. The base for logical understanding of disease symptoms development and diagnostic methods will be acquired. Students are expected to perform practical work (a part of laboratory diagnostic methods) regarding the assessment of renal function and they will be trained to properly interpret the diagnostic results to establish the diagnosis and prognosis of disease.

**Co-lecturers:** Suzana Milinković-Tur PhD, DVM, Terezija Silvija Marenjak, MSc, DVM

**Recommended literature:**

**Examination:** oral exams

Manner of supervising the quality and performance of subject: By the basis of students questioner.

**COURSE LEADER'S CV**

**Nina Poljičak-Milas, PhD, DVM**

Department of pathophysiology, Faculty of Veterinary Medicine University of Zagreb, Heinzelova 55, Zagreb, Croatia, phone: +385 1 2390182, fax: +385 1 2390284, e-mail: nmilas@vef.hr.

See course G44.

**Selected publications:**


Poljičak-Milas, Nina, A. Slavica, Z. Janicki, Mirna Robić, Maja Belić and Suzana Milinković-Tur: Serum biochemical values in fallow deer (Dama dama L.) from different habitats in Croatia. Z. Jagdwiss. 50, 7-12, 2004.


OXIDATIVE AND ANTIOXIDATIVE PROCESSES DURING NORMAL METABOLIC AND STRESS CONDITION

Duration (in hrs): Total 16 (8 lectures, 4 practical and 4 seminars). Credits: 3.5.


Practical: Determination of glucose, total protein, total lipids, free fatty acid, cholesterol, lipoproteins (VLDL, LDL, HDL), antioxidative enzymes (glutathione peroxidase, glutathione reductase, superoxide dismutase, catalase), nonenzymatic molecules (glutathion, vit. E, Vit. C, albumins, uric acid), and TBARS.


Development of general and specific competences (knowledge and skills): Course of Oxidative and antioxidative processes during normal metabolic and stress condition qualifies students for progressive development of knowledge and understanding of basic principles and facts of energy metabolism and free radical formation. Qualifies students for progressive development of knowledge of free radical activity; effects of harm free radical activity from cell structure to the total body. Students will be inform in detail about the organism defence against oxidative stress (in vivo antioxidants). The course qualifies students for progressive development of working knowledge of antioxidative enzyme and nonenzymatic antioxidative molecules determination, as well as process of lipid peroxidation. The aim of this course is to present and analyzes the basic principles of oxidative-antioxidative processes in organism. Through exercises, seminars and lecture of this course the aim is to integrate and synthesize information so that students will achieve a working knowledge of oxidative stress.

Co-lectures: Nina Poljičak-Milas Ph.D. Assistant Professor

Recommended literature:


Examination: oral

Manner of supervising the quality and performance of subject: By the basis of student’s opinion poll.

COURSE LEADER'S CV

Suzana Milinković Tur, Ph.D. Assistant Professor

Department of Physiology and Radiobiology, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, Zagreb, Croatia, Phone. 01 2390 171, fax. 01 2441 390, e-mail: tur@vef.hr
She was born in Požega, 1962. She graduated from Faculty of Veterinary Medicine, University of Zagreb in 1987, she finished her Ms.D. in 1993. and Ph.D. in 1998. Working experience: 1988 – 1989 young researchers at Department of Physiology and Radiobiology, Faculty of Veterinary Medicine, University of Zagreb. 1989 – 2001 assistant at Department of Physiology and Radiobiology, Faculty of Veterinary Medicine, University of Zagreb. 2001 – Assistant professor at the same Department. She has been lecturing at undergraduate and postgraduate studies. Postgraduate lecturing: Veterinary faculty, Zagreb (transport across animals membranes, selected part of heart physiology, selected part of circulation, selected part of carbohydrate metabolism, laboratory biochemical analysis). She has been co-workers in scientific projects: absorption from gastrointestinal tract, metabolism in stress, adaptation and breeding of domestic animals. Since 2001. she has been a head researcher in scientific project «Antioxidative status of domestic animals». Professional Affiliations: Member of Croatian Veterinary Society, Croatian Biological Society, Croatian Physiology Society.

Selected publications:


G47. Suzana Milinković-Tur CARDIOVASCULAR SYSTEM IN DOMESTIC ANIMAL

Duration (in hrs): Total 20 (14 lectures, 2 practical and 4 seminars). Credits: 4.0.


Development of general and specific competences (knowledge and skills): Course of Cardiovascular system in domestic animals qualifies students for progressive development of knowledge and understanding general principles of cardiac muscle physiology and heart as a pump. Develop the knowledge of comparative aspects of action potentials, rhythmic excitation of the heart, cardiac cycle and regulation of heart pumping- autoregulation, nervous, humoral, and endocrine regulation. Course develop the knowledge of physical characteristic of the circulation, functions of the arterial, venous and the lymphatic systems, blood pressure, the microcirculation and integration of cardiovascular function – regulation of systemic arterial pressure, special blood flow: pulmonary, coronary, hepatic, and muscle circulation.

Co-lectures: Nina Poljičak-Milas, PhD. Assistant Professor

Recommended literature:
Izvorni znanstveni članci i pregledni radovi iz znanstvenih časopisa.

Examination: oral

Manner of supervising the quality and performance of subject: By the basis of student’s opinion poll.

COURSE LEADER’S CV
Suzana Milinković Tur, Ph.D. Assistant Professor
Department of Physiology and Radiobiology, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, Zagreb, Croatia, Phone. 01 2390 171, fax. 01 2441 390, e-mail: tur@vef.hr
See course G46.

Selected publications:


G48. Miljenko Šimpraga: PHYSIOLOGY AND PATHOLOGY OF OSTRICHIES IN INTENSELY BREEDING

Duration (in hrs): Total 30 (15 lectures and 15 exercise). Credits: 4.5.

Outline: Ostrich biology and genetics; ostrich anatomy; ostrich fiziology; ostrich farm management; ostrich welfare; ostrich nutrition; incubation and hatching; rearing; preventive veterinary medicine; diseases: viral infections, bacterial infection, fungal infections, parasites; pathological changes;
Exercise: ostrich anatomy; handling and restrain; clinical examination; blood sampling; haematology; clinical blood chemistry.

Co-lecturers: Maja Popović, PhD, assistant professor; Krešimir Babić, PhD, professor; Tajana Trbojević Vukičević, Ms, research assistant; Darko Grbeša, PhD, professor; Željko Pavličić, PhD, assistant professor; Hrvoje Mazija, PhD, professor; Albert Marinculić, PhD, professor; Marina Tišljar, PhD, research assistant; Mario Vrabec DVM; Blanka Ljubić Beer dipl. ing.

Recommended literature:

Examination: written and oral

COURSE LEADER'S CV
Miljenko Šimpraga, Ph.D. Professor
Department of physiology and radiobiology, Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia. tel: ++385 1 2390-170; fax: ++385 1 2441-390; e-mail: miljenko.simpraga@vef.hr
He was born in Šibenik, Croatia, 8. February. He finished Veterinary Faculty University of Zagreb in 1983. Ms D. in 1988 and PhD in 1993. Working experience on Veterinary Faculty University of Zagreb: Young
researcher - Clinic of Surgery, orthopedics and ophthalmology (1983-1984); Professional Collaborator - Department of Physiology and Radiobiology (1984-1988); Research Assistant - Department of Physiology and Radiobiology (1988-1993); Scientific Assistant - Department of Physiology and Radiobiology (1993-2000); Assistant professor - Department of Physiology and Radiobiology (2000 – 2004); Associate professor - Department of Physiology and Radiobiology (2004 - ). Research interests: Physiology; Organic agriculture; Veterinary Nuclear Medicine. Research activity: classification papers - 2; scientific papers - 38; abstracts - 20; professional papers - 25; projects: principal investigator – 1, consultant – 1, collaborator – 8. Awards: The State Award for Popularization of Science for 2001

Selected publications:

G49. Miljenko Šimpraga
EXERCISE PHYSIOLOGY

Duration (in hrs): Total 15 (10 lectures and 5 exercise). Credits: 3,5.

Outline: The blood; cardiovascular system; respiratory system; muscular system; termoregulation; hormonal responses; energy metabolism.

Exercise: exercise of dogs and horses; heart rate; respiratory rate; temperature rate; blood pressure; blood sampling; haematology; clinical blood chemistry; results interpretation.

Co-lecturers: Zvonko Stojević, associate professor; Suzana Milinković Tur, PhD, assistant professor; Nikša Lemo, Ms, research assistant; Blanka Ljubić Beer dipl. ing.

Recommended literature:

Examination: written and oral
COURSE LEADER'S CV
Miljenko Šimpraga, Ph.D. Professor
Department of physiology and radiobiology, Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia, tel: ++385 1 2390-170; fax: ++385 1 2441-390; e-mail: miljenko.simpraga@vef.hr
See course G48.

Selected publications:

G50. Miljenko Šimpraga:
DIGESTIVE PHYSIOLOGY OF MONOGASTRIC ANIMALS

Duration (in hrs): Total 10 (6 lectures and 4 exercise). Credits: 3.0.

Outline: comparative aspects of digestive; digestive in mouth; digestive in stomach; digestive in small intestine; digestive in large intestine

Exercise: digestive in mouth; digestive in stomach; digestive in small intestine

Co-lecturers: Zvonko Stojević, associate professor; Jasna Piršljin, Ms, research assistant; Maja Zdelar Tuk, Ms, research assistant.

Recommended literature:

Examination: written and oral

COURSE LEADER'S CV
Miljenko Šimpraga, Ph.D. Professor
Department of physiology and radiobiology, Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia, tel: ++385 1 2390-170; fax: ++385 1 2441-390; e-mail: miljenko.simpraga@vef.hr

See course G48.

Selected publications:

G51. Miljenko Šimpraga: RESPIRATION PHYSIOLOGY IN DOMESTIC MAMMALS

Duration (in hrs): Total 6 (4 lectures and 2 SEMINARS). Credits: 2.5.

Outline: mechanics of respiration; gas transport; regulation of respiration;

Exercise: comparative aspects of respiration

Recommended literature:


Examination: oral

COURSE LEADER'S CV
Miljenko Simpraga, Ph.D. Professor
Department of physiology and radiobiology. Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia, tel: ++385 1 2390-170; fax: ++385 1 2441-390; e-mail: miljenko.simpraga@vef.hr

See course G48.

Selected publications:


**G52.**

**Petar Kraljević:**

**BIOLOGICAL EFFECT OF IONIZING RADIATION**

**Duration (in hrs):** 12 lectures, 8 seminars. Credits: 4.0.


**Development of general and specific competences (knowledge and skills):** After attending the course, students will receive knowledge from elementary radiobiology specialty from cellular radiobiology. These knowledge and skills are necessary for scientific research whether ionizing radiation effects are investigated or ionizing radiation is used for inhibition of living process in cells.

**Co-lecturers:** mr. sc. Marinko Vilić

**Recommended literature:**


Examination: written.

Manner of supervising the quality and performance of subject: Student poll

COURSE LEADER’S CV
Petar Kraljević, Ph.D. Professor
Department for Physiology and Radiobiology. Faculty of Veterinary medicine, University of Zagreb, Zagreb, Croatia. Phone: +385 1 2390 178, fax: +385 1 2441 390, e-mail: kraljev@vef.hr
See course M1.

Selected publications

G53. Petar Kraljević:
RADIOIMMUNOASSAY (RIA) INVESTIGATION OF THYROIDE FUNCTION.

Duration (in hrs): 5 lectures, 10 practical). Credits: 3,0.

Practical: Assessment of specificity, sensitivity, accuracy, reproducibility, precision of some RIA-kits. Determination of T3, T4 and TSH in blood plasma of some domestic animals.

Development of general and specific competences (knowledge and skills): Students will learn how to use RIA methods in their research work so that they could expand their research possibilities in regard to its methodology.

Co-lectures: Marinko Vilić, MS, Ecija Blašković, BS.

Recommended literature:


Examination: written.

Manner of supervising the quality and performance of subject: Student poll

COURSE LEADER’S CV
Petar Kraljević, Ph.D. Professor
Department for Physiology and Radiobiology. Faculty of Veterinary medicine, University of Zagreb, Zagreb, Croatia. Phone: +385 1 2390 178, fax: +385 1 2441 390, e-mail: kraljev@vef.hr

See course M1.

Selected publications:


G54. Velimir Sušić:
MODERN GENETIC APPROACHES IN IMPROVEMENT OF LIVESTOCK PRODUCTIVITY AND HEALTH

Duration (in hrs): total 20; lectures 10, practicals 4, seminars and consultations 6. Credits: 4,5.

Outline: Lectures: Variability of economically important traits in different livestock species; phenotypic manifestation of genes; genetic diversity within and between different livestock species; breeding methods; quantitative and molecular genetic methods in improvement of livestock productivity and disease resistance; DNA markers; quantitative and qualitative trait loci; comparable and functional genomics; introducing molecular genetic information and bioinformatics into the plans for livestock selection.

Practicals, seminars and consultations (depending on scientific interest for particular livestock species, student can chose between 4 different fields): cattle breeding (lecturer Ivo Karadjole, PhD, full professor) - theoretical basis for different selection plans in beef and milk production and disease resistance; pig breeding (lecturer Tomislav Balenović, PhD, full professor) - possibilities for genetic improvement in fertility, survival piglets, meat production, meat quality and disease resistance in pigs; poultry breeding (lecturer Velimir Sušić, PhD, associated professor) - scientific assumptions for development of crossbred lines with desired meat production, egg production and disease resistance; sheep and goat breeding (lecturer Velimir Sušić, PhD, associated professor) - breeding and selection schemes and new methods in genetic improvement for meat production, milk production and disease resistance.

Development of general and specific competences (knowledge and skills): The students will obtain specific knowledge about genetically condition of poultry products of different hybrids, especially knowledge of genetically dependent resistance to specific diseases.

Co - lecturers: Ivo Karadjole, PhD, full professor; Tomislav Balenović, PhD, full professor (possibly scientists from Croatian Veterinary Institute, Centre for livestock reproduction in Croatia and other research institutions from Croatia or abroad)

Recommended literature:


Selected scientific and professional journals; Internet

Examination: written and oral

Manner of supervising the quality and performance of subject: Statut of University

COURSE LEADER'S CV

Velimir Sušić, PhD, associated professor
Department of animal husbandry, Veterinary Faculty University of Zagreb, Heinzelova 55, 10 000 Zagreb, tel. 385 01 2390 224; 385 01 2390 122; Fax: 385 01 2441 390; e-mail: susic@vef.hr

See course M3.

Selected publications:


G55. Marija Vučemilo
POULTRY AND GAME BIRD ECOLOGY, ETHOLOGY AND TECHNOLOGY

Duration: Total 72 (38 lectures, 17 exercise, 17 seminars). Credits: 5,5.

Outline: Health ecology: specific conditions of housing and keeping of particular poultry and game bird species and categories; effect of particular technologic factors on poultry health and productivity in
intensive breeding; stress and its impact on poultry health and productivity; role of animal hygiene in ecologic poultry breeding; air pollution and its impact on poultry and human health; prevention of conditional diseases associated with bioclimate; light and ventilation control in poultry housing; effect of microclimate on litter hygiene; selection of setting eggs and egg manipulation; specificities of incubation of particular poultry species; alternative poultry housing and keeping. Hygiene and medical sanitation: animal waste disposal (composting, biogas, undesired odor reduction); new generation of disinfectants in poultry breeding; current approaches in poultry ectoparasite control – ecologically acceptable insecticides; current principles of murine pest control at poultry farms; hygiene and microclimate of incubators: causes of increased embryonal death rate during egg incubation. Ethology: poultry behavior in the conditions of cage and battery housing; poultry social behavior; role of stress in poultry productivity and health state; abnormal behavioral patterns (etiopathies) of poultry.

**Development of general and specific competences (knowledge and skills):** Theoretical and practical education of students for obtaining knowledge on technological principles of successful poultry and game birds production.

**Co-lecturers:** Professor Boris Krsnik, Ph.D., Assist. Professor Željko Pavičić, Ph.D., Professor Alenka Tofant

**Recommended literature:**


**Manner of supervising the quality and performance of subject:** Statut of University

**Examination:** Exam is oral.

**COURSE LEADER'S CV**

Professor Marija Vučemilo, Ph.D.

Department of Animal Hygiene, Ecology and Ethology, School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia, phone: +385 1 2390 291; E-mail: vučemilo@vef.hr

See course G20.

**Selected publications:**

Estella Prukner-Radovčić: BACTERIAL DISEASES OF ECONOMICALLY USABLE Poultry

Number of hours: Total 20 (10 hours lectures, 5 exercises, 5 seminar). Credits: 3,5.

Outline: The aim of this course is to make attendees acquainted with current bacterial diseases of poultry and game birds and to train them for in time discover, prevention and eradication of mentioned diseases. Bacterial infections (streptococcosis, staphylococcosis, erysipelas, listeriosis, pasteurella infections, infectuous Coryza, bordetellosis (turkey Coryza), moraxella infections, Ornibacterium rhinotracheale infection, colibacillosis, colisepticaemia, coligranulomatosis, salmonella infections, specific salmonella infections of poultry, spirochetosis, leptospirosis, campylobacter infection, aeromonas infection, clostridial diseases, mycoplasmosis, avian chlamydiosis), mycoses and mycotoxicosis (systematic mycoses, dermatomycoses, mycotoxicoses). Exercises: Laboratory diagnostic of bacterial diseases of poultry and game birds and practical work in bacteriology laboratory. Seminars: Systems of control bacterial infections by use of competitive exclusion, immunoprophylaxis and medication.

Development of general and specific competences (knowledge and skills): The students will obtain specific knowledge about bacterial infection specific for economically utilizable poultry as primary or opportunistic pathogens in combinations with stress. They will learn more about their prevention and control.

Co - lecturers: Prof. dr. sc. Hrvoje Mazija, Prof. dr. sc. Zdenko Bidin, Danijela Horvatek, DVM

Literature:
Selected papers and Internet

Manner of supervising the quality and performance of subject: Statut of University

Examination: Exam is oral.

COURSE LEADER'S CV
Estella Prukner - Radovčić, Ph.D.
Birth date and birthplace: 22. 05. 1955. Zagreb; institutional affiliation: Faculty of Veterinary Medicine; Education: 1981 DVM, Faculty of Veterinary Medicine, University of Zagreb, Croatia; 1990, Ph.D. (Ph.D. Dissertation: "Presence of sulphite-reducing bacteria of genus Clostridium in feeds and stuffs and their role in diseases in poultry"); Employment: 1982-1987, Assistant, Poultry Institute, 1987-1991, Scientific Assistant, Poultry Institute, 1992-1993, Assistant Professor, Department of Poultry Pathology, 1993-2002, Research Associate Professor, Department of Poultry Pathology, 2002- Associate Professor, Department of Poultry Diseases, Faculty of Veterinary Medicine, University of Zagreb; Training: 1987- Ministerie van
Landbouw - Rijksontledingslaboratorium, Antwerpen, Belgium; 1991- Institute für Hygiene und Infektionskrankheiten der Tiere, Justus-Liebig; Universität Giessen, Giessen, Deutchland; 1996, 1997 - Institute für Geflügelkrankheiten, Ludwig-Maximilian Universität München, Oberschleissheim, Deutchland; 1999 - Association of Avian Vet., continuing education, New Orleans, USA; 2002 - Institute für Geflügelkrankheiten, Fraie Universität, Berlin, Deutchland; Ivited profesor: Prehrambeno biotehnološki fakultet Zagreb; Veterinarski fakultet, Sarajevo, BiH; Graduate students directed: 4; published papers: 117; Papers presented at the international meetings: 29; Invited speaker: 10; Professional societies: World Poultry Science Association-CRO, President; World Veterinary Poultry Association - Croatia, Secretary; Croatian Microbiology Society (Secretary General 1997-2001);Association of Avian Veterinarians, Member; New York Academy of Science, Member(since 1996); Hrvatsko prirodoslovno društvo godine 1885-Society for Electron Microscopy, Member; Croatian Veterinary Chamber, Member; Croatian Veterinary Society 1893, Member; Flemish-Croatian Chamber of Commerce, protective member since 1992; Croatian Inventors Society “Dr. Oton Kučera”. Member of Executive Committee


Selected papers:


**G57.** Hrvoje Mazija:

**VIRAL DISEASES OF ECONOMICALLY USABLE POULTRY**

**Number of hours:** Total 24 (10 hours lectures, 5 exercises, 9 seminar). Credits: 4,0.

**Outline:** The meaning of the etiological complexes where viruses have the most important role. Actual viral infections with immunosuppressive infect, Marek’s disease, leucosis/sarcoma group, reticuloendotheliosis, avian influenza, goose Parvovirus infection, duck hepatitis B virus infection, chicken...
infectious anemia, Adenovirus infections of poultry, pox, Picornavirus infections, Reovirus infections, infectious bursal disease, Togavirus infections, Paramyxovirus infections, Rhabdovirus infections. The aim of this course is to make attendees acquainted with current diseases of poultry and game birds and to train students for to discover them, prevent and eradicate.

Exercises: Laboratory diagnostic of diseases of poultry and game birds and practical work in virology laboratory.

Seminars: Immunoprophylaxis of virus diseases of poultry modes of vaccine application, creation of programs to control diseases regarding actual epidemiological situation.

Development of general and specific competences (knowledge and skills): The students will obtain knowledge on the characteristics of viral infections, especially those that cause specific diseases and control by the law. They will be able to recognize nosological complex in which viruses prevalent etiologically. Furthermore, they will gain knowledge about specific and unspecific prophylaxis to virus diseases of economically utilize poultry.

Co-lecturers: Zdenko Bidin, DVM, PhD, professor, Estella Prukner-Radovčić, DVM, PhD, associated professor, Irena Ciglar Grozdanić, MSc, Željko Gottstein, DVM

Literature


Examination: Exam is oral.

Manner of supervising the quality and performance of subject: Statut of University

COURSE LEADER’S CV

Hrvoje Mazija, PhD
Date of birth: July 2nd 1940; Education: Veterinary faculty matriculation 1958; DVM 1964; MSc 1969; PhD 1976; Employment and duties: 1966 Assistant, Faculty of Veterinary Medicine, University of Zagreb; 1978 Assistant Professor, Faculty of Veterinary Medicine, University of Zagreb; 1981 Associate Professor, Faculty of Veterinary Medicine, University of Zagreb; 1982-85 Head of Poultry Center, Faculty of Veterinary Medicine, University of Zagreb; 1986 Full Professor, Faculty of Veterinary Medicine, University of Zagreb; Head of Department of Avian Diseases, Faculty of Veterinary Medicine, University of Zagreb; Education and specialisation: 1966 - Laboratories of "Lohmann" Industries, Cuxhaven, Deutchland; 1971 - Laboratories of "Kimber farms, Inc", Freemont, California, U.S.A.; 1971 - Royal Veterinary School, Copenhagen, Denmark; 1971 - Laboratories of "Laboratorios Sobrino", Olot, Spain; Poultry Institute, Doorn, Netherlands; Institute fur Geflügelkrankeiten, Ludwig-Maximilian Universität Munchen, Deutchland; Academy of Sciences, Budapest, Institut for Avian Diseases, Hungary; Athens, Georgia, Department of Avian Medicine, Poultry Diagnostic and Research Center; Ames, Iowa, ARS, NADC; Membership: The World's Poultry Science Association-Croatian Branch, Member of executive committee; World Veterinary Poultry Association-Croatian Branch, President; Croatian Veterinary Chamber; Croatian Veterinary Association - Vice president; Croatian Veterinary Society; Croatian Association of Innovators; Zagreb association of technical culture - President; Awards: "Red Danice Hrvatske s likom Nikole Tesle", 1995; "Faust Vrančić" 1995 for tehcnical culture; Golden Medal INPEX XI, 1995., Pittsburgh, PA, Croatian Version, SAD; Brussels Eureka 2000. Medaille d'or avec mention-SONOVAC® 095 immunisation contre la maladie de Newcastle; Godišnja nagrada Eduard Slavoljub Penkala 2000, Induciranje imunog odgovora protiv Newcastle'ske bolesti primjenom ultrazvučnog raspršivača; INOVA-Zagreb, 2000, srebrna plaketa za novi proizvod-Pokusno cjepivo protiv
Selected papers:


Number of hours: Total 20 (10 hours lectures, 5 exercises, 5 seminar). Credits: 3,5.

Subject of course: 1. Mycoses (systematic mycoses, dermatomycoses), mycotoxicoses, metabolic disorders. 2. Nutritional diseases (hemorrhagic syndrome, mononitosis, adipose liver and kidney syndrome, malabsorption syndrome, cardiac death, edematous disease, gizzard erosions in poultry, diseases caused by sufficiency or deficiency of active feed components, hydropericard-ascites syndrome).

Exercises: Laboratory diagnostic of mycoses and metabolic diseases of poultry and game birds and practical work in laboratory for microbiology.

Seminars: Modes of control of influence of mycoses and mycotoxins and toxic effect of chemopharmaceutical products.

Development of general and specific competences (knowledge and skills): The students will gain knowledge about the mycoses that endanger poultry and game birds health, and toxicoses accompanying by mycotoxins. They will learn diseases due to nutritional failures responsible for reducing poultry production.

Co - lecturers: Hrvoje Mazija, DVM, PhD, professor, Estella Prukner-Radovčić, DVM, PhD, associated professor

Literature:


Examination: Exam is oral.

Manner of supervising the quality and performance of subject: Statut of University COURSE LEADER'S CV
Zdenko Bidin, PhD

Date of birth: November 2nd 1947; Education: Veterinary faculty matriculation 1966; DVM 1973; MSc 1980; PhD 1984; Employment and duties: 1973. Assistant, Faculty of Veterinary Medicine, University of Zagreb; 1976. Head of Virology Laboratory, Poultry Center, Faculty of Veterinary Medicine, University of Zagreb; 1985. Research Associate, Faculty of Veterinary Medicine, University of Zagreb; 1987. Assistant Professor, Faculty of Veterinary Medicine, University of Zagreb; 1992., Associate Professor, Faculty of Veterinary Medicine, University of Zagreb.; 1998. Full Professor, Faculty of Veterinary Medicine, University of Zagreb; 1993-1995, 1999-2003 Associate Dean of Veterinary Faculty ; 1995-1999 Dean of Veterinary Faculty; Assistant of Minister of Science and Technology of Republic of Croatia; Education and specialization: 1980 Virology Laboratory, Lohman, Cuxhaven, Germany; 1982 Technical Education, BUT, Ross, Norwich, Great Britain; Membership: World Veterinary Poultry Association-Croatian Branch; Croatian Microbiological Society; European Society for Veterinary Virology; Awards: 1985 INOVA-Zagreb: A silver medal for a new product.

Selected papers:


G59. Hrvoje Mazija: PARASITES AND INVASIVE DISEASES OF POULTRY AND GAME BIRDS

Number of hours: Total 28. Credits: 4.0.

Outline: General data about parasitic invasions in poultry, causative agents, disease descriptions, pathomorphological changes, diagnosis and therapy of histomoniasis, coccidiosis, toxoplasmosis, echinostomosis, iloophthalmosis, cestodes, nematodes of the digestive tract, nematodes of the respiratory tract and external parasites and pests. 

Exercises: Practical work and recognition of coccidia and helminthes, coprological diagnostics, external parasites.

Development of general and specific competences (knowledge and skills): The students will obtain knowledge on the diseases of intensive poultry and game birds production and the principles of their prevention by drug therapy or vaccination.

Collaborator: Albert Marinculić, DVM, Ph.D., professor

Literature:


Examination: Exam is oral.

Manner of supervising the quality and performance of subject: Statut of University

COURSE LEADER'S CV
Hrvoje Mazija, PhD
See course G57.

Selected papers:


G60. Zdenko Bidin:
AVIAN IMMUNOLOGY AND IMMUNODIAGNOSTICS METHODS

Number of hours: Total 43. Credits: 4,5.


Course objectives: The aim of this course is to make attendees acquainted with characteristics of the avian immune system, its physiologic function in creating specific and unspecific resistance; the act of the various active substances which can stimulate or suppress immune reaction. The attendees will also be introduced in latest achievements for estimating the immune competence obtained by use of molecular and immunology techniques.

Development of general and specific competences (knowledge and skills): The students will be introduced in to the avian immune system and an immune response to pathogens. They will learn the structure and function of lymphoid tissues in immune response to immunogens and the immunological techniques for measure that response.

Co - lecturers: Biserka Pokrič, DVM, PhD, senior scientist, Ivana Lojkic, MSc

Literature:


Examination: Exam is oral.

Manner of supervising the quality and performance of subject: Statut of University
COURSE LEADER'S CV
Zdenko Bidin, PhD
See course G58.

Selected papers:

G61. Estella Prukner-Radovčić
COMPANION BIRDS DISEASES

Number of hours: Total 40 (15 hours lectures, 10 exercises, 15 seminar). Credits: 4,5.

Subject of course: Common infectious diseases: bacterial, viruses, mycoses, mycoplasmas, zoonotic diseases. Parasitic diseases, neurologic signs, ophthalmic signs.
Exercises: Diagnosis of diseases using physical examination and anamnesis, hematology and cytology, laboratory diagnostics; emergency therapy and supportive care, therapy, anesthesiology.
Seminars: Nonspecific and specific modes of diseases control in breeding flocks - flock preventive medicine, nutritional diseases, metabolic diseases, common diseases of neonates, companion bird behavior, special considerations in managing columbiformes and passerine patients and common diseases, quarantine.

Development of general and specific competences (knowledge and skills): The students will obtain knowledge on biology and pathology of the pet birds, especially those of bacterial and viral etiology, the methods of their identification, prevention and treatment.

Co - lecturers: Danijela Horvatek, DVM, Željko Gottstein, DVM

Literature:

Selected papers and Internet
Examination: Exam is oral.

Manner of supervising the quality and performance of subject: Statut of University
See course G56.

Selected papers:


G62. Estella Pukner-Radovčić

INFLUENCE OF FREE—LIVING BIRDS ON ANIMAL AND HUMAN HEALTH

Number of hours: Total 11. Credits: 3.0.

Course program: Importance of zoonoses will be distinguished especially viral, bacterial, fungal and invasive with emphasis on those with highest risk for poultry and people in intensive production. Those are chlamydiosis, salmonella infections, campylobacter infection, tuberculosis, pseudo tuberculosis, avian influenza and Newcastle disease. Together with mentioned, public health aspects of following diseases will be presented in smaller volume: colibacillosis, erysipelas, listeria infections, streptococcosis, toxoplasmosis, cryptosporidiosis, encephalitis, verrucoseness, anthrax, aspergillum infections, histoplasmosis, Q-fever, sarcosporidiosis and trichphytosis. During practical lectures, specificities of avian clinical examination will be presented, together with blood sampling, sampling of material for laboratory analyses (virology, bacteriology and cytology), ambulatory performance of different laboratory probes, medical treatment (selection and principles of drug application), emergency actions, principles of active and inactive vaccine application.

Development of general and specific competences (knowledge and skills): The students will be able to recognize diseases of game birds that endanger other animals and human health. They will get introduced to principle of control and prevention the spread of diseases.

Co - lecturers: Hrvoje Mazija, DVM, PhD, professor, Danijela Horvatek, DVM

Literature:


Examination: Exam is oral.
Manner of supervising the quality and performance of subject: Statut of University

COURSE LEADER'S CV
Estella Prukner - Radovčić, Ph.D.
See course G56.

Selected papers:
Furthermore, they will get introduced to the procedures of prevention and control of diseases concerning the causative agent connected with high temperature of the environment.

**Co-lecturers:** Boris Krsnik, DVM, PhD, professor, Željko Gottstein, DVM

**Literature:**


**Examination:** Exam is oral.

**Manner of supervising the quality and performance of subject:** Statut of University

**COURSE LEADER’S CV**

Hrvoje Mazija, PhD

See course G57.

**Selected papers:**


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**G64.** Željko Grabarević: MORPHOGENESIS INFECTIOUS AND INVASIVE DISEASES OF POULTRY

**Duration (in hrs):** 16 lectures, 4 practical. Credits: 3,5.

**Outline:** Pathogenesis and morphology (gross lesions and histopathology) important viral, bacterial, fungal and invasive diseases of poultry. Attachment to and entry microorganisms into the body. Events occurring immediately after the entry of the microorganisms into the body. The encounter of the microorganisms with the phagocytic cells. Local and general spread microorganisms in the body. Evasion of host defences. Mechanisms of cell and tissue damage (infection with no cell or tissue damage, direct damage by microorganisms, microbial toxins, indirect damage via inflammation, indirect damage via the immune response – immunopathology, other indirect mechanisms of damage). Shedding (exit) microorganisms from body. Gross pathology and histopathology changes in the tissues.

**Co-lectures:** Dr. sc. Milivoj Mikec, dr. sc. Vladimir Savić

**Recommended literature:**


**Examination:** Oral exam.

**COURSE LEADER’S CV**

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**G65.** Branimir Mioković: ACTIVITY OF MICROORGANISMS IN FOOD

**Number of hours:** Total 30 (15 hrs of lecture, 15 hrs of seminar). Credits: 5,5.
Outline: Lectures: Microbial ecology; Ecological importance of microorganisms in the nutritional chain; Systematic, taxonomy, physiology and genetics of microorganisms in food; Evaluation of hygienic and technological significance of microorganisms; Influence of technological processing procedures on microorganisms in food; “Starter-cultures”; Pathogenic bacteria in foodstuffs; Influence of product composition and storage conditions on microorganisms; Microbiological aspects of sanitation in the food production and trade.

Seminars: Food production and microorganisms; Food spoilage; Specific spoilage microorganisms; Microbiologic quality of foodstuffs; Influence of microorganisms on the foodstuffs shelf-life; Characteristics of bacteria in foodstuffs; Fermented meat products; Fermented dairy products; Influence of technological processing procedures on microorganisms in food (cooling, freezing, pasteurisation, sterilisation, salting, curing, smoking, drying, lyophilisation and aeration)

Development of general and specific competences (knowledge and skills): It is the task of lecturers to teach the students about modern methods of scientific-research works in the field of food microbiology. The lecture studies the ecological meaning of microorganisms in the food chain. Through exercises and seminars, students will learn how to perform modern techniques of isolation and determination of microorganisms causing spoilage of foodstuffs or foodborne diseases.

Co-lecturers: Mirza Hadžiosmanović, PhD, full professor; Bela Njari, PhD, full professor; Lidija Kozafićinski, PhD, assistant professor; Nevijo Zdolec, DVM

Literature for students:
Recommended magazines: Food microbiology, Journal of Food protection.

Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER
Branimir Mioković, PhD, full professor
Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390192, fax 012390191

Born in Osijek and graduated from the secondary school in 1968. In 1973, graduated from the Veterinary Faculty of the University of Zagreb, and was employed by the Faculty as assistant at the Department of Foodstuff Hygiene and Technology. Served military service at the School of reserve veterinary officers in 1975. In 1976, I defended successfully my master’s dissertation and won my master’s degree in the field of Foodstuff hygiene and technology. In 1982, defended my doctoral dissertation under the title "Investigation of reliability of some culture media for rapid qualitative and quantitative confirmation of the presence of Clostridium perfringens in food products " and obtained my doctor’s degree. In 1984, passed the professional aptitude test for veterinary inspector with the Republic committee for agriculture and forestry in Zagreb and was appointed scientific researcher at the Veterinary faculty. In 1985, enrolled in the Register of researchers in the Republic committee for science, technology and information of Croatia under number 01/1-14/03-85. In 1985, nominated for docent for the subjects Hygiene and technology of meat and fish and Hygiene and technology of milk, and renominated in 1993. Appointed associate professor in 1998 for the subjects Hygiene and technology of meat and fish and Hygiene and technology of milk. In 2004,
advanced to the rank of full professor for the subject Foodstuff hygiene and technology. I am a member of the Croatian Veterinary Society and of the Croatian Microbiology Society.

**Selected papers:**


Pavić, S., D. Laštre, S. Bukovski, M. Hadžiosmanović, B. Mioković, L. Kozačinski: Convenience of Clostridium botulinum agar for selective isolation of B type Clostridium botulinum from dry cured Dalmatian ham during family outbreak. Archiv für Lebensmittelhygiene 2001, 52 (2), 43-45.


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**G66. Branimir Mioković: AUTOCHTHONOUS DAIRY PRODUCTS**

**Number of hours:** Total 20 (10 hrs of lecture, 5 hrs of seminar, 5 hrs of exercises). Credits: 4.0.

**Outline:** Lectures: Production of dairy products in small family farms; Influence of primary production on the quality of autochthonous dairy products; Development trends and lines of research in the production of autochthonous dairy products; Specifics of cheese ripening in the traditional production; Factors of hygiene control and quality of cheeses produced from fresh raw milk; Production of curdles in small family farms; Evaluation of the technological processing procedures of each autochthonous dairy product; Seminars: Veterinary-sanitary aspects in the production and distribution of autochthonous dairy products; Ecologic dairy products; Autochthonous dairy products (Paški cheese, uniqueness of the cheese škripavac; dry cheese from Turopolje; "rooten" cheese; cheese from bladder (mountain sheep’s cheese), "Prgice"; soft cheese and sour cream); Autochthonous dairy products in the EU countries - similarities and differences.

**Development of general and specific competences (knowledge and skills):** Knowledge and skills of this subject include mastering of the technology of autochthonous dairy products, primarily of cheeses, and of autochthonous fermented milk drinks, important for the improvement of their quality in the function of development of licensed products and country side tourism. The subject includes researches on the improvement of hygienic quality and safety of autochthonous dairy products.

**Co-lecturers:** Mirza Hadžiosmanović, PhD, full professor; Bela Njari, PhD, full professor; Lidija Kozačinski, PhD, assistant professor; Željka Cvrtila, MSc; Nevijo Zdolec, PhD

**Literature for students:**


Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER
Branimir Mioković, PhD, full professor
Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390192, fax 012390191
See course G65.

Selected papers:

G67. Nadica Maltar Strmečki:
PHYSICAL METHODS IN PRESERVATION AND ANALYSIS OF FOODSTUFFS OF ANIMAL ORIGIN

Duration (in hrs): 10 lectures, 5 practical and 5 seminars. Credits: 3.5.

Practical: Determination the physical propertise of foodstuff (density, concentration, temperature, humidity, relitive humidity, pH). Determination of microclimatic factors (temperature, relatvie humidity, atmospheric pressure).
Seminars: Spectroscopy: EPR, NMR, UV. Microwave oven.

Development of general and specific competencies (knowledge and skills): It is anticipated that student will gain basic knowledge in applied technologies which are necessary for preservation and analysis of foodstuff of animal origin.

Co-lectures: Nadica Maltar-Strmečki, M Sc

Recommended literature:

Examination: oral examination and written essay on the selected topic form the current scientific literature
Manner of supervising the quality and performance of subject: Anonymous students’ questionnaires

COURSE LEADER’S CV

Vladimir Mrša: BIOCHEMISTRY OF FOODSTUFFS

Duration (in hrs.): 10 (5 lectures, 5 seminar). Credits: 3.0.


Development of general and specific competencies (knowledge and skills): Acquisition of basic knowledge of metabolism and cell functioning required for comprehending processes in food of the animal origin during processing, storage, preparation and consumption. Special emphasis will be put on nutritional characteristics of food and their changes in mentioned processes.

Co-lecturers: Renata Teparić, Laboratorij za biokemiju, Prehrambeno-biotehnološki fakultet, Sveučilište u Zagrebu

Recommended literature:


Examination: oral

Manner of supervising the quality and performance of subject: Quality control will be assured through student inquiries.

COURSE LEADER’S CV

Vladimir Mrša, Ph.D. Professor
Laboratory of biochemistry, Faculty of Food Technology and Biotechnology, University of Zagreb, Pierottijeva 6, Zagreb, tel. 01 4605 040, fax 01 4836 083, e-mail vmrsa@pbf.hr

Born 1957 in Zagreb. In 1975 enrolled Department of Biotechnology, Faculty of Technology in Zagreb, graduated 1980. Postgraduate studies at Faculty of Science, Chemistry/Biochemistry. 1984 defended Ph.D. thesis at Laboratory of Biochemistry, Faculty of Food Technology and Biotechnology in Zagreb. From 1988 to 1990 postdoctoral fellow of Deutschakademischeaustauschdienst (DAAD) at the University of Regensburg, Germany in the Laboratory of Cell Biology. In frame of further collaboration several visits in the same Laboratory. International courses in Kupari 1981, Maria Alm, Austria, 1983 and FEBS advanced course in Jeres de la Frontera, Spain in 1986. Since 1980 young assistant at Laboratory of Biochemistry, Faculty of Food Technology and Biotechnology in Zagreb. 1985 elected research assistant, 1990 docent, and 1996 associate professor. Elected as professor in 1999. Lecturing: Faculty of Food Technology and Biotechnology, organising courses in “Separation methods and analysis of proteins” and “Biochemistry of food”, participation in courses “Biochemistry I and II”, and “Molecular biology”. Besides, leading courses “Physiology and biochemistry of nutrition” at postgraduate studies Nutrition, Faculty of Food Technology and Biotechnology, as well as courses “Separation methods and analysis of biomolecules” and
“Glycoproteins-structure and function” at postgraduate studies of Chemistry Faculty of Science, University of Zagreb. Scientific/professional activities: Author of 31 papers (25 CC and/or SCI) and 1 international patent. As member of organizing or scientific committee participated in organisation of more scientific meetings. Member of Croatian Society for Biochemistry and Molecular Biology (secretary from 1991. to 1996.), Croatian Society for Biotechnology and Croatian Microbiological Society (member of Executive Committee since 2001). 1992.-1997. president of IAESTE-Croatia. Since 2003. dean of Faculty of Food Technology and Biotechnology.

Selected publications:


Development of general and specific competences (knowledge and skills): Aim of the subject is to provide students with knowledge and skills for scientific researches in the field of quality evaluation and knowledge of game meat for the purpose of improving hunting tourism.

Co-lecturers: Mirza Hadžiosmanović, PhD, full professor, Prof.dr.sc. Branimir Mioković, PhD, full professor, Lidija Kozačinski, PhD, assistant professor; Željka Cvrtila, MSc, Nevijo Zdolec, PhD

Literature for students:

Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER
Bela Njari, DSc, Full professor
Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390193, fax 012390193

Born in Bjelovar and graduated from the secondary school in 1972. In 1978, graduated from the Veterinary Faculty of the University of Zagreb. First job (1978) as a veterinary trainee in the Veterinary station Bjelovar, ambulance Rovišće. The same year, appointed for assistant at the Cattle-breeding Department of the Agricultural Faculty of the University of Osijek, subject Knowledge of animals products, and also for assistant (supplementary job), subject Knowledge of animal raw material in industrial production at the Foodstuff-Technological Faculty of the same University. In 1983, I defended my dissertation and won my master’s degree in the field of Foodstuffs hygiene and technology; MZT identification number 086384. In 1986, defended doctoral dissertation and won my doctor’s degree in medicinal science – field veterinary medicine. In 1987, nominated as scientific researcher in the field of veterinary medicine. In 1988, nominated for docent for the subjects Hygiene and technology of meat and fish and Hygiene and technology of milk. Nomination for docent for these two subjects was confirmed in 1993 after the evaluation of my educational work. Appointed for associate professor in 1998 for the subjects Hygiene and technology of meat and fish and Hygiene and technology of milk. In 2002, advanced to the rank of full professor for the subject Foodstuff hygiene and technology. Presently, I am a member of the Croatian Veterinary Society and of the Croatian Microbiology Society.

Selected papers:

G71. Lidija Kozačinski:
EPIDEMIOLOGY OF FOOD-BORNE DISEASES

Number of hours: Total 20 (5 hrs of lecture, 15 hrs of seminar). Credits: 4.0.
Outline: Lectures: Importance of microorganisms in the nutritional chain; Bacteria causing alimentary infections and intoxications; Microorganisms causing food spoilage; Alimentary zoonoses; Significance of viruses in foodstuff hygiene; Routes of microbiological contamination of raw materials and products; Influence of product composition and storage conditions on microorganisms.

Seminars: Escherichia coli and other coliform bacteria present in food; Salmonella spp. in food; Shigella spp. in food; Vibrio spp. in food; Aeromonas hydrophila in food; Campylobacter spp. in food; Yersinia enterocolitica in food; Listeria spp. in food; Staphylococcus aureus in food; Determination of staphylococcal enterotoxin in incriminated foodstuffs; Bacillus cereus in food; Clostridium spp. in food (C. perfringens and C. botulinum); Fungi, yeasts and moulds in foodstuffs; Mycotoxins.

Development of general and specific competences (knowledge and skills): The aim of the subject is to train the students of the doctor’s study for scientific researches in the field of epidemiology of foodborne diseases. Education includes modern methods of scientific-research works in the field of epidemiology, epizootiology and microbiology of food, and the effect of various microclimate factors of preservation and technological procedures on microorganisms in food.

Co-lecturers: Branimir Mioković, PhD, full professor; Bela Njari; Lidija Kozacinski, PhD, assistant professor; Željka Cvrtila, MSce; Nevijo Zdolec, PhD

Literature for students:
Selected magazines.

Manner of supervising the quality and performance of subject: According to the University Statute.
CURRICULUM VITAE OF THE LECTURER

G72. Bela Njari:
QUALITY CONDITIONS OF MEAT AND MEAT PRODUCTS

Number of hours: Total 20 (5 hrs of lecture, 5 hrs of exercises, 10 hrs of seminar). Credits: 3.5.

Outline: Lectures: Principles of the science of meat; Genetic, physiological and nutritional factors of growth, utilisation at slaughter and meat yield in animals for slaughter; Muscle structure and its conversion into meat; Autolysis; Meat composition and characteristics; Procedures, equipment and work organisation in the processing of cattle, pig and sheep at slaughter; Collection and utilisation of blood and other by-products; Meat deterioration; Assortment, shelf life and sensor evaluation of the meat product quality; Standards of meat and meat product transportation; Meat cutting and categorisation in the sale and processing; Knowledge and evaluation of quality of vegetable foodstuffs; Organisation and new programs of veterinary-sanitary control in the production and processing of meat.

Exercises and seminars: Conditions for freshness and shelf life of meat and meat products; Evaluation of meat quality on the slaughtering lines; Classification and description of some important methods of sensor analysis of meat and the meat products; Evaluation of the curing brine quality; Storage of meat and meat
products; Processing of slaughtering by-products; Sanitation and evaluation of its effect in the production, processing and distribution of meat.

Field practice: Visit to a meat industrial plant.

Development of general and specific competences (knowledge and skills): This subject includes the meat science principles and introduction of modern factors in the evaluation of quality of meat and meat products, and training of students for independent scientific-research work in the hygiene and technology of meat and meat products.

Co-lecturers: Mirza Hadžiosmanović, PhD, full professor; Branimir Mioković, PhD, full professor; LidiJa Kozačinski, PhD, assistant professor; Nevijo Zdolec, PhD

Literature for students:

Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER
Bela Njari, PhD, full professor
Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390193, fax 012390193
See course G70.

Selected papers:
Outline: Lectures: Production of milk in our country and in the world; Safety of milk production; Influence of health and dairy (milking) cows keeping on milk quality; Hygienic milk production; Ecologic milk production; Influence of nutrition on milk quality; Diseases transmitted by milk; Influence of milk processing to risk reduction of bacterial diseases transmitted by milk; Conditions of milk quality; Risks of milk production on family farms.

Exercises and seminars: Chemical composition and nutritional substances of milk; Milk from farm to table; Bacteriocidal substances of milk; Milk quality control; Legal regulation of milk quality (Law acts which regulate milk quality); Procedure with milk after milking; Relationship between number of somatic cells and composition of milk; Milk monitoring in Republic of Croatia; Hygiene quality of milk.

Field practice: Visit to the Central Milk Control Laboratory in Križevci

Development of general and specific competences (knowledge and skills): Aim of the subject is extending students’ knowledge for running scientific researches in the evaluation of health safety and hygienic quality of milk and dairy products. The subject includes principles of milk science and trends of development and research in dairy production.

Co-lecturers: Branimir Mioković, PhD, full professor; Bela Njari, PhD, full professor; Lidija Kozačinski, PhD, assistant professor; Željka Cvrtila, MSc; Nevijo Zdolec, PhD

Literature for students:


Havranek, J., V. Rupić (2003): Mlijeko od farme do mljekare. HMU. Zagreb


Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER

G74. Željka Cvrtila Fleck:
CHEMICAL METHODS IN FOOD ANALYSIS

Duration (in hours): 15 (lectures 5, seminars 3, practical 7). Credits: 3,0.


Seminars. Specimen collection to support chemical analysis. Results interpretation. Results validation. Quality control of chemical procedures. Acute phase protein's application for monitoring the health and welfare of production animals and for identifying the health status of slaughter animals.

products. Chlorinated hydrocarbon insecticides, polychlorinated biphenyls, dioxins. Organophosphorus compounds
Practical. Organoleptic tests of foodstuffs and point score systems. Determination of total, connective tissue and muscular proteins. Lipid and water detection in foodstuffs. Rancidity test. Sodium chloride, nitrate, nitrite and polyphosphate analysis.

Development of general and specific competences (knowledge and skills): Practical knowledge with actual chemical instrumental techniques in food analysis. Training to enable the students to perform scientific work.

Co-lecturer: Željka Cvrtila, MSc

Literature:
Fifeld, F.W. i D. kealy (1990): Principles on practic of analytical chemistry. Black and sons, Glasgow

Examination: oral exam and exam paper

Manner of supervising the quality and performance of subject: According to the University Statute.

COURSE LEADER'S CV

G75. Željka Cvrtila Fleck: CHEMICAL COMPOSITION OF FOODSTUFFS OF ANIMAL ORIGIN AND CHANGES DURING STORING AND PROCESSING

Duration (in hours): 10 ( lectures 5, seminars 5). Credits: 2,5.

Outline. Composition and nutritional data ( slaughter animals, poultry, ostriches, eggs, rabbits, wildlife, fishes, crabs, clams, frogs, turtles, milk and milk products). Molecular structure’s sameness and diversity of proteins, lipids and carbohydrates in different foods. Changes in chemical constitution during meat and milk processing.

Development of general and specific competences (knowledge and skills): Knowledge regarding the influence of chemical structure and chemical reactions on the quality and shelf life of food during storage and processing with emphasis on harmful effects and residues. Training to enable the students to perform scientific work.

Co-lecturer: mr.sc. Željka Cvrtila

Literature:
Belitz, H.-D. , W. Grosch (1999): Food Chemistry (2nd Edition); Springer-Verlag, Berlin
Selected papers from scientific journals: Livestock Production Science; Toxicology; Food Chemistry; Food Research International; Trends in Food Science and Technologies; Meat Science; International Dairy Journal; The Veterinary Journal; Molecular Aspects of Medicine and others.
Examination: oral exam and exam paper
Manner of supervising the quality and performance of subject: According to the University Statute.
COURSE LEADER’S CV

G76. Lidija Kozačinski
LABORATORY METHODS IN FOOD MICROBIOLOGY

Number of hours: Total 20 hrs (5 hrs of lecture, 10 hrs of exercises and 5 hrs of seminar). Credits: 3,5.
Outline: Lectures: Microbiological standards for foodstuffs; Microbiological standards in our country and in the world (ISO standards, Croatian standards); Laboratory accreditation; Classical and modern methods in food microbiology; Sampling for microbiological analysis; Statistical quality control; Errors and precision of methods of analysis.
Exercises and seminars: Good laboratory practice; Sampling for microbiological analysis; Preparation of samples for microbiological analysis; Course of microbiological analysis of food (total bacteria count, total count of aerobic sporogeneous bacteria, Salmonella spp., Campylobacter spp., L. monocytogenes, Yersinia enterocolitica, Enterobacteriaceae, E. coli, Clostridium perfringens, C. botulinum, and sulphite-reductase clostridia); Interpretation of results of microbiological analysis of food; Classical and rapid methods of microbiological tests; Croatian/ISO standards; Algebraic and logarithmic calculation in microbiology; Measurement uncertainty.
Development of general and specific competences (knowledge and skills): Practical laboratory work is the basis of scientific researches in food microbiology. Students will master modern techniques of isolation and identification of microorganisms and their biochemical activity.
Co-lecturers: Mirza Hadžiosmanović, PhD, full professor; Branimir Mioković, PhD, full professor; Prof.dr.sc. Bela Njari, PhD, ; Nevijo Zdolec, PhD.
Literature for students:

Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER

Lidija Kozačinski, PhD, assistant professor

Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390190, fax 012390191

Born in Zagreb and graduated from the secondary school in 1976. In 1982, graduated from the Veterinary Faculty, University of Zagreb. First job (1983) at the Department of foodstuffs hygiene and technology, Veterinary Faculty Zagreb. In 1986, completed the post-graduate studies and won master’s degree in the field of Foodstuff hygiene and technology. In 1987, appointed for a young researcher of the same Department, and one year later enrolled in the Register of researchers under No. 069745. In 1988, appointed for scientific assistant for the field of veterinary medicine. In 1994, participated in the International foodstuff microbiology course, Zagreb. Having received the scholarship from SAB and FEMS attended and completed the course "Food-borne bacterial pathogens" u Sutton Bonington (UK) in 1994. In 1997, completed the course Becton Dickinson Crystal ID Systems, Zagreb. In 1999, defended doctoral dissertation under the title "Isolation procedures and the importance of the bacterium Listeria monocytogenes in foodstuff hygiene". In 1999, appointed for higher research assistant and for higher collaborator assistant for the subject Foodstuffs hygiene and technology. In 2002, became an assistant professor for the subject Foodstuff hygiene and technology. In 2004, successfully completed the workshop "Standardised microbiological methods in food control". Presently, full member of the Croatian Academy of Medicinal Sciences, a member of the Croatian Veterinary Society, secretary of the Croatian Microbiology Society and a member of PO 8 - Microbiology of the State Institute for standardisation and metrology, member of the Croatian Dairy Association and World Poultry Science Association. Redactor of journal "Meso".

Selected papers:


G77. Bela Njari: MANAGEMENT OF FOODSTUFF PRODUCTION AND QUALITY CONTROL

Number of hours: Total 20 (20 hrs of lecture). Credits: 3,0.

Outline: Lectures: Approach to marketing management; Management of veterinary-sanitary control procedures; World trends in the organisation of foodstuff production and control (monitoring) from the aspect of production and quality control management; Production management and organisation of the quality control of foodstuffs from the aspect of their safety, quality and acceptability.

Development of general and specific competences (knowledge and skills): Aim of the subject is to prepare interested candidates for research of the marketing management in the food production and quality control as a rational safety strategy. The subject includes knowledge of the world trends in foodstuffs management and food quality.

Co-lecturers: Bela Njari, PhD, full professor; Lidija Kozačinski, PhD, assistant professor;

Literature for students:


Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER
Bela Njari, PhD, full professor, Full Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390193, fax 012390193

See course G70.

Selected papers:

G78. Bela Njari: HYGIENE AND QUALITY OF HONEY

Number of hours: Total 5 (3 hours of lectures, 1 hour of exercises and 1 hour of seminar). Credits: 2,5.

General contents: Lectures: Types of honey; honey composition and quality; shelf life and sensor evaluation of honey; health safety of honey; antibiotic and sulphonamide residues in honey; antibacterial
activity of honey; honey production; honey-based products; honey declaration; veterinary-sanitary control in the production, processing and distribution of honey.  
Exercises and seminars: Methods of sensor analysis of honey and other honey-based products; physical and chemical analysis of honey; microbiological quality of honey and honey products.  
**Development of general and specific competences (knowledge and skills):** Aim of the subject is education of students with regard to investigation of the quality and safety of honey and honey products and mastering of modern laboratory practice related to microbiological and chemical analyses.  
**Co-lecturers:** Mirza Hadžiosmanović, PhD, professor; Branimir Mioković, PhD, professor; Lidija Kozačinski, PhD, docent; Željka Cvrtila, MSc; Nevijo Zdolec, DVM  
**Literature for students:**  
*Codex alimentarius*  
**Manner of supervising the quality and performance of subject:** According to the University Statute.  

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**G79.** Lidija Kozačinski:  
**EVALUATION OF QUALITY OF POULTRY MEAT AND EGGS**  
**Number of hours:** Total 10 (5 hrs of lecture, 2 hrs of exercises, 3 hrs of seminar). Credits: 3.0.  
**Outline:** Lectures: Poultry meat as food; Influence of rearing conditions on quality of poultry meat; Health safety of poultry meat; Evaluation of poultry meat quality on the slaughtering lines; Factors influencing the shelf life of poultry meat; Contamination of poultry meat by pathogenic bacteria; Procedures, equipment and work organisation in the industrial processing of poultry meat; Eggs control in human health protection; Eggs safety (“from a farm to table”); Food poisoning caused by eggs; Organisation and new programs of veterinary-sanitary control in the production, processing and trade of poultry meat and eggs; Exercises and seminars: Poultry meat composition and characteristics; Quality of chicken meat; Evaluation of poultry meat freshness and shelf life; Codex alimentarius (poultry meat and products); Control and evaluation of egg freshness; Chicken eggs; Eggs of other fowl; Evaluation of egg freshness; Microbiological analysis of poultry meat and eggs; Equipment characteristics and organisation of the production process; Sanitation and evaluation of its effect in the production, processing and trade of poultry meat and eggs.  
Field practice: Visit to a poultry slaughterhouse  
**Development of general and specific competences (knowledge and skills):** Students should be well acquainted with current trends in poultry science, and with evaluation of health and hygienic quality of poultry meat and eggs. The subject includes scientific researches in the field of improvement of poultry meat and egg processing, as well as the ways of their storage and distribution.
Co-lecturers: Mirza Hadžiosmanović, PhD, full professor; Branimir Mioković, PhD, full professor; Bela Njari, PhD, full professor; Željka Cvrtila, MSc; Nevijo Zdolec, PhD

Literature for students:


Selected journals fro the Institute Library.

CURRICULUM VITAE OF THE LECTURER

Lidija Kozačinski, PhD, assistant professor

Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390190, fax 012390191

See course G76.

Selected papers:


technical-technological demands for slaughterhouses and meat processing buildings. Meaning of processes control and practice implementation.

**Development of general and specific competences (knowledge and skills):** Processing engineering includes modern technologies in production of foodstuffs. Aim of the subject is education of students with regard to improving technological methods of production in function of safety and quality foodstuffs.

**Literature for students:**
Čavlek B.: Advances in Thermal Treatment in Meat Technology in ”Advances in Food Process Engineering” EFAPTM, Ed. Konja, Lovrić, D.
Štrucelj, Tripalo, PB, Zagreb (1992) 124-142

**Manner of supervising the quality and performance of subject:** According to the University Statute.

**CURRICULUM VITAE OF THE LECTURER**

**G81.** Branimir Mioković:

**MODERN PROCEDURES OF MILK PROCESSING**

**Number of hours:** Total 10 (5 hours of lectures, 2 hours of exercises, 3 hours of seminars). Credits: 3,0.

**General contents:** Lectures: Development and research trends in the production of milk and dairy products; composition and main properties of milk; primary production and its effect on the quality of milk and dairy products; investigation and development of milk-based products (colostrum, whey etc.); novel technologies in dairy industry; alternative methods of heat processing; enzymatic hydrolysis of milk proteins and carbohydrates; novel technologies in the production of fermented dairy products; lactic-acid fermentation and probiotics; bases of cheese production; influence of technologies on sensor characteristics of cheese; organisation of veterinary-sanitary control in the production, processing and distribution of milk.

Exercises and seminars: Milk freshness; sensor properties of milk and dairy products; storage of milk and dairy products; modern procedures of milk preservation; production of pasteurised and long-lasting milk; role of microbial cultures in the production of fermented milk beverages; role of microbial cultures in the production of cheese; production of butter; specifics of ice-cream production technologies; modified and aromatised milk; powder milk; immediate containers in milk industry; properties of equipment and organisation of the production process in milk production; sanitation and evaluation of its effect in the production, processing and distribution of milk and dairy products.

Field practice: visit to a dairy industry, visit to the central laboratory for milk control in Križevci.

**Co-lecturers:** Branimir Mioković, PhD, professor, Bela Njari, PhD, professor, Lidija Kozačinski, PhD, docent, Željka Cvrtila, MSc, Nevio Zdolec, DVM

**Literature for students:**
Selected magazines in the Institute library.
Examination: Preparation of an independent seminar paper, oral exam.
Manner of supervising the quality and performance of subject: According to the University Statute.
CURRICULUM VITAE OF THE LECTURER

G82. Petar Kraljević: RADIATION HYGIENE

Duration (in hrs): 10 lectures, 4 seminars, 6 practical. Credits: 4.0.

Seminars: 1) Protection of domestic animals and food in the event of nuclear accident. 2) Decontamination of the milk and meat.
Practical: 1) Radiation detection with ionizing detectors. 2) Gamma-ray spectrometry. 3) Calculation of maximum permissible concentration of radionuclide in animal feed.

Development of general and specific competences (knowledge and skills): Students will acquire knowledge about radioactive contamination of environment, domestic animals and food, their decontamination and protection from radioactive contamination. Such obtained knowledge is necessary for a) scientific research work in the field of radiation hygiene of food, and b) for human protection from radiation dose and radiation risk in the case of nuclear accident since 70% of total radiation dose of humans is caused by milk and meat.
Co-lecturers: Mr. sc. Marinko Vilić

Recommended literature:

Pravilnik o maksimalnim granicama radioaktivne kontaminacije čovjekove okoline i o obavljanju dekontaminacije. Sl. List br. 8. Str. 226.

Examination: written.

Manner of supervising the quality and performance of subject: Student poll
COURSE LEADER’S CV
Petar Kraljević, Ph.D. Professor
Department for Physiology and Radiobiology. Faculty of Veterinary medicine, University of Zagreb, Zagreb, Croatia. Phone: +385 1 2390 178, fax: +385 1 2441 390, e-mail: kraljev@vef.hr
See course M1.

Selected publications


Vilić, M., D. Barisić, P. Kraljević, S. Lulić (2004): 137Cs concentration in meat of wild boars (Sus scrofa) in Croatia o decade and half after the Chernobyl accident. J. Environ. Radioactivity (u tisku).

G83. Lidija Kozacinski:
HYGIENE AND QUALITY OF FISH, CRABS AND SHELLFISH

Number of hours: Total 10 (5 hrs of lecture, 2 hrs of exercises, 3 hrs of seminar). Credits: 3,0.

Outline: Lectures: Fish as food; Influence of the ecological factors, fishing and intensive production on the quality of fish, crab and shellfish meat; Health safety and hygienic quality of fish, crabs and shellfish; Deterioration of fish, crabs and shellfish; Influence of the parasite infestation on the assessment of hygienic quality of fish; Procedures, equipment and work organisation in the industrial fish processing; Assortment, shelf life and sensor evaluation of the fish product quality; Organisation and programs of veterinary-sanitary control in the production and processing of fish.

Exercises and seminars: Quality evaluation and categorisation of fish, crabs and shellfish; Evaluation of fish, crab and shellfish meat freshness and shelf life; Bases of microbiological and parasitological examination of fish, crab and shellfish, and fish products; Storage of fish, crabs and shell-fish; Codex alimentarius (fresh, frozen, salted and smoked fish, crabs, molluscs, shellfish, ground fish meat); Characteristics of equipment and organisation of production process in the production of canned fish meat; HACCP system and sanitation in the export fish industry facilities; Fish storage and processing facilities.

Development of general and specific competences (knowledge and skills): Aim of the subject is to prepare the students, through lectures, exercises and seminars, for research work in the field of veterinary-sanitary control and evaluation of safety of fish, crabs and shellfish. The subject includes principles of science of fish, crabs and shellfish in the evaluation of their health safety and processing technology.

Co-lecturers: Mirza Hadžiosmanović, PhD, full professor, Branimir Mioković, Bela Njari, PhD, full professor, Željka Cvrtila, MSc, Nevijo Zdolec, PhD

Literature for students:


Selected papers from magazines.

**Manner of supervising the quality and performance of subject:** According to the University Statute.

**CURRICULUM VITAE OF THE LECTURER**

Lidija Kozačinski, PhD, assistant professor

Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390190, fax 012390191

See course G76.

**Selected papers:**

Cvrtila, Ž., L. Kozačinski (2003): *Higijensko značenje histamina u namirnicama*. Meso (V), 4, 49-52


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**G84. Bela Njari:**

**MODERN TECHNOLOGIES IN MEAT INDUSTRY**

**Number of hours:** Total 10 (5 hrs of lecture, 2 hrs of exercises, 3 hrs of seminar). Credits: 3.0.

**Outline:** Lectures: Collection and utilisation of blood and other by-products; New methods of meat cooling and freezing; Trends of meat preservation with chemical agents; Salting and curing; Cold smoking; Thermal processing; Modern technological procedures in the production of dry meat products, sausages, canned meat, ready-made-meals and fat; Fermentation of products; Additives and seasonings in meat processing; Assortment, shelf life and sensor evaluation of the meat product quality; Packaging material and packing in meat processing; Use of technical gasses (CO₂, N₂, modified atmosphere); Exercises and seminars: Evaluation of meat freshness and shelf life; Influence of technological procedures on sensor characteristics of meat products; Organoleptical control of sausages, canned meat, ready-made-meals and fat; Evaluation of the curing brine quality; Storage of meat and meat products; Evaluation of quality of packaging material in meat industry; Characteristics of equipment and organisation of the
production process in meat industry; Processing of slaughtering by-products; Modern technologies and SSOP’s.

Field practice: Visit to a meat industrial plant

**Development of general and specific competences (knowledge and skills):** Technologies in meat industry are becoming more and more sophisticated and include a modern scientific approach with an adequate education. Aim of the subject is to train the students to independently perform scientific improvements in the field of meat technology and preservation.

**Co-lecturers:** Mirza Hadžiosmanović, PhD, full professor; Branimir Mioković, PhD, full professor; Lidija Kozačinski, PhD, assistant professor; Željka Cvrljina, MSc; Nevijo Zdolec, PhD

**Literature for students:**


**Manner of supervising the quality and performance of subject:** According to the University Statute.

**CURRICULUM VITAE OF THE LECTURER**

Bela Njari, PhD, full professor

Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390193, fax 012390193

See course G70.

**Selected papers:**


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**G85.** Emil Srebočan

**TOXICOLOGY OF ANIMAL FOODSTUFF**

**Duration:** 45 (15 + 30). Credits: 6.0.

**Outline:** Lectures: Introduction to toxicology. Basis of ecotoxicology. Sources of contamination of animals by xenobiotics (pesticides, heavy metals, industrial toxicants, mycotoxins, poisonous plants, nitrogen compounds, antibiotics, hormones, additives in animal feed, additives in animal foodstuff) from soil to packing. Xenobiotics which remain in animals. Chemical and biochemical characteristics of xenobiotics and their metabolism. Possibilities of contamination of animal foodstuff (meet, milk, eggs). Effect of residua in animal foodstuff on human health. (carcinogenicity, mutagenicity, teratogenicity, reproductive disorders, allergy). HACCP in toxicology animal foodstuff.

Seminars: procedures for determination of (carcinogenicity, mutagenicity, teratogenicity, reproductive disorders, allergy).
Development of general and specific competences (knowledge and skills): Based on the acquired knowledge students will be qualified to anticipate in the scientific research related to animal foodstuff which is carried out in pharmaceutical industry, certain faculties, institutes and related institutions.

Co-lecturers: Prof. Dr. Jelena Pompe-Gotal, Doc. Dr. Andreja Prevendar Crnić.

Recommended literature:
Srebočan, V: Veterinarska toksikologija. Medicinska naklada, Zagreb, 1993
Beyer et al.: Environmental contaminants in wildlife. CRC, Lewis Publisher, 1996.

Examination: oral

Manner of supervising the quality and performance of subject: Student poll

COURSE LEADER'S CV
Emil Srebočan
Department of Pharmacology and Toxicology, Faculty of Veterinary Medicine, University of Zagreb, 10000 Zagreb, Heinzelova 55, Croatia. Telephone: (+385) 01 2390 162, Fax: (+385) 01 2441-390, e-mail: emil@vef.hr

1980 - Graduated Bachelor of Science - Faculty of Veterinary Medicine, University of Zagreb and Initial appointment as trainee at the Department of Pharmacology and Toxicology, Faculty of Veterinary Medicine, University of Zagreb. 1981 - Became assistant at the same Department; 1985 - Obtained Masters Degree having successfully defended my Masters thesis entitled "Lead distribution and histological alterations in parenchymal organs of lead acetate treated chickens."; 1986 - Awarded Scholarship by the United States Department of Agriculture. I spent four months at the Patuxent Environmental Science Center, National Biological Survey, US Department of Interior, Laurel, Maryland, USA, where I was involved with ecotoxicology of heavy metals. 1988-1992 Employed as Teaching Assistant on a course dealing with Internal Diseases, orking in the field as a member of an Outpatients' Clinic. 1989 - Acquired the title of Doctor of Science by defending doctoral thesis entitled "Investigation into the sources and magnitude of cadmium contamination in animals in the Republic of Croatia."; 1992 - Upon completion of my tenure as teaching Assistant I returned to the Department of Pharmacology and Toxicology, where I acquired the position of Scientifically - teaching Degree Assistant Professor; 1998 - Acquired the position of Scientifically - teaching Degree Professor; 2003 Acquired the position of Scientifically - teaching Degree Full Professor. 1992 > - Postgraduate lecturing courses at Faculty of Veterinary Medicine, University of Zagreb. (Toxicology, Poisoning, Clinical Toxicology of Insecticides and Raticides in animals, Noninfectious Diseases and Poisoning in Bees). Member of the Croatian Veterinary Society. Member of the Croatian Toxicology Society.

Selected publications:
G86. Bela Njari:
VETERINARY-SANITARY CONTROL

Number of hours: Total 10 (5 hrs of lecture, 5 hrs of exercises). Credits: 3.0.

Outline: Lectures: Significance of veterinary-sanitary inspection and control in food distribution; Tasks of veterinary-sanitary control, Veterinary-sanitary legislation, Food law and Croatian food agency, Consumers protecting act, Veterinary act, Veterinary inspection organisation in the field of veterinary-sanitary control of foodstuffs;
Seminars: Administrative work, Sampling procedures, Performance of inspection control

Development of general and specific competences (knowledge and skills): Modern principles of veterinary sanitary inspection in food trade are basses of health safety and quality. Aim of the subject is to prepare the students for scientific research works in the field of modern approaches to veterinary-sanitary control and quality of food in the course of production, storage and distribution.

Co-lecturers: Bela Njari, PhD, full professor; Lidija Kozačinski, PhD, assistant professor; Željka Cvrtila, MSc; Nevijo Zdolec, PhD

Literature for students:

Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER
Bela Njari, PhD, full professor
Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390193, fax 012390193

See course G70.

G87. Lidija Kozačinski:
VETERINARY PUBLIC HEALTH
Number of hours: Total 10 (5 hrs of lecture, 5 hrs of seminar). Credits: 2,5.

Outline: Lectures: Definition of the veterinary public health; Strategy of food safety and diet; Good veterinary practice and ethics; Organisation of the veterinary public health; Zoonoses; Doctrine and programs of sanitation in food production and distribution.
Seminars: SQA concept of ensurance of food health safety and quality; LISA concept of integration of supervisory activities and practice; HACCP concept of the risk assessment for the purpose of ensuring health safety and quality of foodstuffs.

Development of general and specific competences (knowledge and skills): Veterinary public health is a part of veterinary sphere of action aimed at the protection of human health. In the field of foodstuff hygiene and technology, the purpose of the subject is to develop scientific researches in the detection of various foodborne noxae. Students are taught about historical development, legislation and global trends of development of the veterinary public health.

Co-lecturers: Branimir Mioković, PhD, full professor; Lidija Kozaćinski, PhD, assistant professor; Željka Cvrtila, MSc; Nevijo Zdolec, PhD

Literature for students:

Manner of supervising the quality and performance of subject: According to the University Statute.

CURRICULUM VITAE OF THE LECTURER

G88. Branimir Mioković
SAFETY OF MEAT AND MEAT PRODUCTS

Number of hours: Total 20 hrs (10 hrs of lecture, 10 hrs of seminar). Credits: 4,0.

Outline: Lectures: Factors of safety of meat and meat products; Monitoring of parameters of meat and meat products safety; General and specific conditions of food production; Applicable regulations for health safety and hygienic quality of food; Food tracing; Regulations for food declaration; Laboratory control and monitoring; Programs of veterinary-sanitary inspection in meat production and processing.
Seminars: General and specific conditions of food hygiene; General principles of food safety; Conditions for determination of health safety and quality of meat and meat products; Applicable regulations for safety of meat and meat products; Food for special nutritional needs; Additives in meat products; Prompt information system; Evaluation of health safety of meat and meat products (sensor properties, microbiological quality, parasite infestations, bio-residues, radiation and its consequences).

Development of general and specific competences (knowledge and skills): Health safety is the basis of meat and meat products quality. The subject will provide students with knowledge and skills needed for independent investigation of the health safety parameters and finding of harmful substances in meat and meat products.

Co-lecturers: Mirza Hadžiosmanović, PhD, full professor; Bela Njari, PhD, full professor; Lidija Kozaćinski, PhD, assistant professor; Željka Cvrtila, MSc, Nevijo Zdolec, PhD

Literature for students:
Manner of supervising the quality and performance of subject: According to the University Statute.
CURRICULUM VITAE OF THE LECTURER
Branimir Mioković, PhD, full professor
Department of Foodstuff Hygiene and Technology, Veterinary Faculty, University of Zagreb, Heinzelova 55, Zagreb, phone 012390192, fax 012390191
See course G65.
Selected papers:


Preporučljiva:


Exam: Oral.

Manner of supervising the quality and performance of subject: students questionnaire.

CURRICULUM VITAE OF THE MENTOR
Prof. Marija Vučemilo, DVM, PhD
Department of animal hygiene, environment and ethology, University of Zagreb, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb, Phone: ++385 1 2390 291, e-mail:

See course G20.

Selected work


G90. Ivana Tlak Gajger:
FISH ANATOMY, HISTOLOGY, PHYSIOLOGY AND EMBRYOLOGY

Total Hours: 75 (lectures 30, practical work 45). Credits: 6,5.

Outline: Basic characteristics of fish anatomy; essentials of fish systematization in controlled breeding; anatomy, histology and physiology of individual organic systems, skin, skeleton, muscular system, vascular system, respiratory system, urogenital system, endocrine system, nervous system, sensory organs; specific characteristics of fish metabolism; breeding; fish embryonic and larval development; growth and growth rate; stress; defense mechanisms and reactions of fish.

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific researches in the field of fish morphology.

Teaching assistants: Assistant Professor Željka Matašin, DVM, PhD

Bibliography for students

**G91. Željka Matašin: BASES OF FISH DISEASE EPIZOOTIOLOGY, PROPHYLAXIS AND THERAPY**

**Total hours:** 45 (lectures 25, practical work 20). **Credits:** 4.0.

**Outline:**
- Causative agents and classification of diseases; general epizootiology of fish diseases (sources of infection, spreading and transmission routes, portals of causative agents, pathogenicity and virulence of causative agents, susceptibility, specific and non-specific resistance factors; stress and diseases; significance of ecology on epizootiology of fish disease (open waters, various breeding systems and their influence on health and onset of certain disease groups, temperature and diseases); planning for prophylaxis in the course of aquaculture constructions planning; ichtiotechnical, ichthiohygienic and ichtiosanitary measures in carp and trout farms as well as in other breeding systems; disinfection, protection of open waters against disease import and spreading; parenteral and peroral drug administration methods; medical immersions in pools and ponds; other treatment and health protection methods; legal and other regulations related to fish health protection.

**Development of general and specific competences (knowledge and skills):**
- Students will be qualified for scientific activities concerning prophylaxis and therapy of fish diseases.

**Teaching assistants:** Prof. Zdravko Petrinec, DVM, PhD, Prof. Željko Župančić, DVM, PhD

**Bibliography for students:**

**Manner of supervising the quality and performance of subject:** students questionnaire.

**Exam:** oral.

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**CURRICULUM VITAE OF THE MENTOR**

**Željka Matašin,** DVM, PhD, Assistant Professor

Department for Fish and Bees Biology and Pathology, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb

See course G27.

**Selected work**

Total hours: 80 hours (lectures 35, practical work 45). Credits: 9.0.


Development of general and specific competences (knowledge and skills): Students will be qualified for scientific activities in fish viral diseases especially laboratory diagnostics.

Teaching assistants: Prof. Željko Župančići, DVM, PhD, Assistant Professor, Željka Matašin, DVM, PhD, Assistant Professor

Bibliography for students:


Le diagnostic


Manner of supervising the quality and performance of subject: students questionnaire.

Exam: oral.
Total hours: 95 (lectures 40, practical work 55). Credits: 9,0.


Development of general and specific competences (knowledge and skills): Students will be qualified for scientific activities in bacterial fish diseases especially bacterial laboratory diagnostics.

Teaching assistants: Prof. Zdravko Petrinec, DVM, PhD, DVM, PhD, Prof. Tomo Naglić, DVM, PhD

Bibliography for students:


Manner of supervising the quality and performance of subject: students questionnaire.

Exam: oral

CURRICULIM VITAE OF THE MENTOR
Željka Matašin, DVM, PhD, Assistant Professor
Department for Fish and Bees Biology and Pathology, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb
See course G27.

Selected work

G94. Ivana Tlak Gajger:
FUNGAL FISH DISEASES

Total hours: 35 (lectures 20, practical work 15). Credits: 5,5.

Outline: Branchiomyocosis, Saprolegniosis, Ichthyophoniasis

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific activities in fungal fish diseases.

Teaching assistants: Željka Matašin, DVM, PhD, Assistant Professor, PhD, Prof. Tomo Naglić, DVM, PhD

Bibliography for students:
Le diagnostic

Manner of supervising the quality and performance of subject: students questionnaire.

Exam: oral

CURRICULIM VITAE OF THE MENTOR

G95. Ivana Tlak Gajger:
PARASITIC FISH DISEASES

Total hours : 40 (lectures 15, practical work 25). Credits: 5,0.


Development of general and specific competences (knowledge and skills): Students will be qualified for scientific work in parasitic fish disease especially field and laboratory diagnostics.

Teaching assistants: Željka Matašin, DVM, PhD, Assistant Professor

Bibliography for students:
Le diagnostic

Manner of supervising the quality and performance of subject: students questionnaire.
Exam: Oral

CURRICULIM VITAE OF THE MENTOR

G96. Željka Matašin:
PESTS AND ENEMIES OF FISH

Total hours: 25 (lectures 10, practical work 15). Credits: 4,0.

Outline: Mammals, birds, reptiles, amphibians, fish and insects as fish enemies, fish-farming pests

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific activities about pests and enemies on fish farms.

Teaching assistants: Prof. Zdravko Petrinec, DVM, PhD, Assistant Professor

Bibliography for students:

Manner of supervising the quality and performance of subject: students questionnaire.
Exam: oral

CURRICULIM VITAE OF THE MENTOR
Željka Matašin, DVM, PhD, Assistant Professor
Department for Fish and Bees Biology and Pathology, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb

See course G27.

Selected work
Ivana Tlak Gajger:
NON-INFECTIONOUS DISEASES AND POISONINGS OF FISH

Total hours: 40 hours (20 lectures, 20 practical work). Credits: 6.0.

Outline: Asphyxia, traumatisations, diseases caused by sudden temperature changes and extreme temperatures, gas embolisms, fish poisoning in water, ceroid liver degeneration, internal organs greasing, meteorism, alimentary toxicoses, aplhatoxicosis, hypovitaminoses and avitaminoses, changes in metabolism of aminoacids, fatty acids and minerals, tumors.

Development of general and specific competences (knowledge and skills): Students will be qualified for scientific activities about poisoning, asphyxiation, traumatisation and changes caused by abiotic factors.

Teaching assistants: Željka Matašin, V.M.D., Assistant Professor

Bibliography for students:


de Kinkelin, P., C. Michel, P. Ghittino: Precis de pathologie des poisson. OIE, Institut National de la Recherche Agronomique, 1986. Chapters:

Les maladies provoquées par les composants de l’environnement
Maladies d'etiole indeterminate et limites de la etiologie


Manner of supervising the quality and performance of subject: students questionnaire.

Exam: oral

CURRICULUM VITAE OF THE MENTOR

Ivica Valpotić:
EXSOGENOUS AND ENDOGENOUS IMMUNOMODULATION

Duration (in hrs): 10 lectures, 5 seminars, 5 practicals. Credits: 4,0.

Outline: Lectures: Historical aspects of immunomodulation in domestic animals; Rationale for use of immune response modifiers (IRMs); Targets of immunomodulation; Classification of IRMs; Mechanisms of action of IRMs; Immunity and stress – an interaction concept; Definition of stress; Types of stress; Neuroendocrine response to stress; Relationships between psychoneuroendocrine and immune systems; Interactions of neuropeptides/hormones with immune cells/molecules; Brain – immune interactions.

Seminars: Model systems to study IRMs; Effects of stress on animals; Effects of stress on swine immune system; Self and nonselff experiences.

Practical: Demonstration of methods for assessment of immunocompetence (lymphocyte stimulation test, flow cytometry; immunohistology, morphometry); DNA-typing for evaluation of immunoreactivity, disease resistance and stress.

Development of general and specific competences (knowledge and skills): After learning of thematic unit student will be able to; consider a significance of preventive/therapeutic potentials of egzogenous and endogenous immunomodulation in veterinary medicine and public health; critically consider rationale and aims of use of the nonspecific immunomodulation in veterinary practice; understand the mechanisms of action of IRMs, and analyze potentials and limitations of particular groups of IRMs; accept and apply the knowledge about stress as an egzogenous and endogenous immunomodulator; synthesize and relate the facts about interactions between neuroendocrine and immune systems; recognize potentials of the IRMs in diminishing/ preventing adverse effects of stress on health and welfare of domestic animals.

Co-lecturers: Maja Popović, Ph.D., assistant professor; Ana Kovšca-Janjetović, BS; Mirna Brkljačić,
Recommended literature:


Examination: oral

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb, according to students and international review

COURSE LEDERS CV

Ivica Valpotić, Ph.D., full professor
Department of Biology, Veterinary Faculty, University of Zagreb, Heinzelova 55, 10000 Zagreb, tel.: 01 2590-144, e-mail: valpotic@vef.hr

See course M11.

Selected publications:


Gerenčer M, I Valpotić, B Jukić, M Tomašković, I Bašić 1989 Qualitative analyses of cellular immune functions in equine infectious anemia show homology with AIDS. Arch Virol 104: 249-257


Valpotić I, E A Dean, H W Moon 1989 Phenotyping of pigs for the presence of intestinal receptors mediating adhesion of enterotoxigenic Escherichia coli-bearing K88ac pilus antigen by ELISA. Vet arhiv 59: 161-175


Valpotić I, N Višković, K Trutin-Ostović, T A Case, E A Dean-Nystrom, G Lacković 1994 Identification and distribution of CD+ T cell subsets in porcine gut following experimental infection with F4ac+ enterotoxigenic Escherichia coli (ETEC) or non-ETEC strains. Regional Immunol 6: 387-390


MUCOSAL IMMUNOBIOLOGY OF MAMMALS

Duration (in hrs): 10 lectures, 5 seminars, 5 practicals. Credits: 4.5.

Outline: Presentation of importance of in mucosal immunobiology in biomedical sciences, particularly in veterinary medicine, with special reference to its achievements in the area of molecular immunology and mucosal immunomodulation of significance for diagnosis, prevention and therapy of microbial/parasitic diseases, and immunodeficient/alegic/autoimmune disorders in domestic mammals. The course would be presented through following thematic units: Mucosal immune system (MIS) – introductory notes; Mucosal barrier – development and physiology of mucosal defense; Inductive and effector tissues and cells of the MIS; Functional characteristics of the MIS; Mucosal immunity and infection; Mucosal vaccines and adjuvants:

Development of general and specific competences (knowledge and skills): After learning of thematic unit student will be able to: consider a significance of mucosal immune system (MIS) in the context of health protection and improvement of health and welfare of domestic mammals; critically consider biological potentials of the local mucosal immunity in relation to the systemic immunity; synthesize the facts about mucosal immunomodulation and recognize the potentials of its regulation; recognize benefits and limitations of mucosal biological products and immune response modifiers in veterinary practice;

Co-lecturers: Maja Popović, Ph.D., assistant professor; Ana Kovšca-Janjatović, BS; Mirna Brkljačić, DVM

Recommended literature:

Examination: oral

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb, according to students and international review

COURSE LEDERS CV
Ivica Valpotić, Ph.D., full professor
Department of Biology, Veterinary Faculty, University of Zagreb, Heinzelova 55, 10000 Zagreb, tel.: 01 2390-144, e-mail: valpotic@vef.hr
See course M11.

Selected publications:
Gerenčer M, I Valpotić, B Jukić, M Tomašković, I Bašić 1989 Qualitative analyses of cellular immune functions in equine infectious anemia show homology with AIDS. Arch Virol 104: 249-257
Valpotić I, E A Dean, H W Moon 1989 Phenotyping of pigs for the presence of intestinal receptors mediating adhesion of enterotoxigenic Escherichia coli-bearing K88ac pilus antigen by ELISA. Vet arhiv 59: 161-175
Vijtiuk N, S Ćurić, G Lacković, I Udovičić, I Vrbanac, I Valpotić 1995 Histopathological features in the small intestine of pigs infected with F4ac+ non-enterotoxigenic or enterotoxigenic strains of Escherichia coli J Comp Path 112: 1-10
Valpotić I, N Vijtiuk, K Trutin-Ostović, T A Casey, E A Dean-Nystrom, G Lacković. 1994 Identification and distribution of CD+ T cell subsets in porcine gut following experimental infection with F4ac+ enterotoxigenic Escherichia coli (ETEC) or non-ETEC strains. Regional Immunol 6: 387-390

G100. Tomislav Babić: LIJEČENJE OZLJEDA MEKIH ČESTI KUĆNIH LJUBIMACA

G101. Darko Capak: FARM ANIMAL ABDOMINAL SURGERY


Development of general and specific competences (knowledge and skills): Students have to able to do abdominal surgery in farm animal which are performed every day praxis.

Associates: Antun Brkić DVM. Ph.D University professor, Josip Kos DVM. Ph.D University professor, Tomislav Babić DVM. Ph.D, Assistant professor and Dražen Matić DVM. Ph.D Assistant professor, Boris Pirk DVM. Master of science, Berislav Radišić DVM Ph.D., Mario Kreszinger DVM. Master of science, Dražen Vnuk DVM. Master of science, Marko Stejskal DVM. Marija Lipar DVM.

Literature:


Examination: oral

Manner of supervising the quality and performance of subject: based on polling, based on the Statute of the University of Zagreb

COURSE LEADER'S CV:
Darko Capak, Ph.D.DVM

Clinic of Surgery, Orthopeadics and Ophthalmology, Veterinary Faculty. Heinzeloova 55, Zagreb

Darko Capak was born in 19th of September 1956 in Zagreb, and graduated at Veterinary Faculty in Zagreb at 11th of May 1981. 1.04.1982. He become an assistant at Mobile Clinic of Veterinary Faculty for courses: «Surgery, orthopeadics and ophthalmology, in 1988 he become an assistant in science at field of Veterinary medicine and register number is 116995. In 1990 he become a doctor of science, 1992 become a lecturer of surgery, orthopeadics and ophthalmology at Mobile Clinic. In 1995 was transfered to the Clinic of surgery, orthopeadics and ophthalmology, 1997 become and associated Professor. He was a tutor to 69 students who did their graduation thesis, and 3 Master’s thesis. He is the leader of two courses, participate in a few courses at subject of surgery orthopeadics and ophthalmology at post graduate study. Professor Capak published one chapter of the students book, 8 scientific works reproduced in tertiar publication, 13 scientific work reproduced in secundary publication, 3 scientific work published in international magazines, 11 scientific works published in Croatian magazines, 2 guest lecturers, 3 scientific work in extension from international science meeting, 5 summary, 1 text- book and 2 students book. He had published 14 experimental wooks and had translated 66 summary which was published in magazine “Veterinarstvo”. He is a member of Croatian Veterinary Association and Croatia academy of Medicine.

Selected publications:


Darko Capak: STOMACH AND INTESTINE SURGERY IN SMALL ANIMALS


Development of general and specific competences (knowledge and skills): Students have to able to do abdominal surgery in farm animal which are performed every day praxis.

Associates: Antun Brkić DVM. Ph.D University professor, Josip Kos DVM. Ph.D University professor, Tomislav Babić DVM. Ph.D, Assistant professor and Dražen Matić DVM. Ph.D Assistant professor, Boris Pirkić DVM. Master of science, Berislav Radišić DVM Ph.D., Mario Kreszinger DVM. Master of science, Dražen Vnuk DVM. Master of science, Marko Stejskal DVM. Marija Lipar DVM.

Literature:

Examination: oral

Manner of supervising the quality and performance of subject: based on polling, based on the Statute of the University of Zagreb

COURSE LEADER'S CV:
Darko Capak, Ph.D.DVM
Clinic of Surgery, Orthopeadics and Ophthalmology, Veterinary Faculty, Heinzelova 55, Zagreb
See course G101.

Selected publications:

G103. Josip Kos
ANESTEZIJA FARMSKIH ŽIVOTINJA
Credits: 4,5.

G104. Josip Kos
ANESTEZIJA KONJA
Credits: 4,5.

G105. Josip Kos
ANESTEZIJA PASA I MAČAKA
Credits: 4,5.

G106. Josip Kos
ANESTEZIJA PTICA, DIVLJIH LABORATORIJSKIH I EGZOTIČNIH ŽIVOTINJA
Credits: 3,5.

G107. Josip Kos
HROMOSTI GOVEDA
Credits: 5,0.

G108. Dražen Matići
KIRURŠKO LIJEČENJE TUMORA U PASA I MAČAKA

G109. Antun Brkić
FUNDAMENTALS OF ORTHOPEDIC SURGERY IN DOGS AND CATS

Duration (in hrs): 3 outline, 5 practical. Credits: 2,5.
Outline: Preoperative concerns, Preoperative coaptation, Robert Jones Bandages, Splints, Sp Anesthetic considerations, Antibiotics, Antimicrobial therapy for bone infections, Bone healing, Radiographic Appearance of bone healing, Postoperative care and assessment, Passive physiotherapy, Bandages, Complications, Special age consideration
Practical: Preoperative concerns, Bandages, Antibiotics and antimicrobial therapy, Radiographic Appearance

**Development of general and specific competences (knowledge and skills):** Recognition of orthopaedics diseases and differential diagnosis of basic orthopaedics diseases.


**Recommended literature:**

**Manner of supervising the quality and performance of subject:** Public opinion

**COURSE LEADER’S CV:**
Professor dr. sc. Antun Brkić,
Clinic of Surgery, Orthopedics and Ophthalmology, University of Zagreb.

Professor dr. sc. Antun Brkić, born on March 1, 1946 in Zagreb, Croatia, recieved his degree in veterinary medicine from the University of Zagreb in 1971. Upon graduation, Dr. Brkić was selected as an assistant for the Clinic of Surgery, Orthopedics and Ophthalmology at the University of Zagreb where presently, he holds the position as director of the clinic. «Possibilities of Providing Medical Insurance for Dogs Requiring Special Care During Surgical Procedures» was the title of Dr. Brkić's Master's Thesis, which he completed at the University of Zagreb in 1978. Upon presentation of his thesis, Dr. Brkić was promoted to the position of Assistant Professor. During 1979–1980, Dr. Brkić pursued his doctoral studies in surgery and orthopedics at the Veterinary University in Vienna, Austria. The theme of his doctoral dissertation, completed in 1984 from the University of Zagreb, was «Artificial Fiber Tissue Replacement as a Method of Curing Hip Joint Arthrosis in Dogs.» Upon completion of his PhD, Dr. Brkić was promoted to the position of Docent at the Clinic of Surgery, Orthopedics and Ophthalmology at the University of Zagreb. In 1992, he was selected as a research scientist by the Veterinary University of Zagreb, and in 1993 was promoted to a tenured professor. He holds the distinction of being listed in the «Who's Who in the Field of Veterinary Medicine», registration number 5573. He is a participant, author and co-author of more than 100 scientific and research studies, and has been a distinguished guest speaker at numerous national and international veterinary symposiums. Dr. Brkić's field of interest includes orthopedics and traumatology in pets and wild animals. His expertise in veterinary medicine also carries over to human medicine and he is frequently included in world-wide joint research projects between medical science and veterinary science. Dr. Brkić's participation as a panel member is frequently requested by students defending their Doctorate and Masters Degrees in both veterinary and human medicine. His hobbies include literature, theater, art, music and travelling. He is a member of numerous professional and social organizations.

**Selected publications:**


Antun Brkić:  
FUNDAMENTALS OF FRACTURE MANAGEMENT IN DOGS AND CATS  

Duration (in hrs): 3 outline, 5 practical. Credits: 2,5.


Practical: Examination forelimb and rear limb.

Development of general and specific competences (knowledge and skills): Students have to learn how to prevent shock, transport an basic care of patients who safe from bone fracture.


Recommended literature:


Manner of supervising the quality and performance of subject: Public opinion

COURSE LEADERS CV:
Professor dr. sc. Antun Brkić,
Clinic of Surgery, Orthopedics and Ophthalmology, University of Zagreb.

See course G109.

Selected publications:


G111. Antun Brkić:
FRACTURE FIXATION SYSTEMS IN DOGS AND CATS

Duration (in hrs): 3 outline, 5 practical. Credits: 2.5.

Outline: External coaptation, External skeletal fixators, Internal fixation: Intramedullary pins, Orthopedic wire, Bone plates and screws, Postoperative care
Practical: External and internal fixation with intramedullary pins, wire and screws

Development of general and specific competences (knowledge and skills): At the basis on tests students have to choose the best typ of immobilisation of bones as temporary therapy or permanent therapy.


Recommended literature:

Manner of supervising the quality and performance of subject: Public opinion

COURSE LEADER S CV:
Professor dr. sc. Antun Brkić,
Clinic of Surgery, Orthopedics and Ophthalmology, University of Zagreb.
See course G109.

Selected publications:

**G112.** Antun Brkić: NEUROGENIC FACTORS IN JOINT PAIN AND DISEASE PATHOGENESIS

**Duration (in hrs):** 3 outline, 5 practical. Credits: 2,5.

**Outline:** Pain in joint disease, Sensory innervation of joints, Autonomic innervation of joints, Sources of articular pain, Clinical aspects of articular pain, Neural contributions to the pathophysiology of joint disease, Neurogenic inflammation, Neuropeptide and joint metabolism, Clinical evidence for neural involvement in joint disease, Clinical aspects of neural involvement in disease pathogenesis.

**Practical:** Clinical examination of joint, Neural examination

**Development of general and specific competences (knowledge and skills):** On the basis of previous knowledge and lectures student can recognize painful joint.


**Recommended literature:**

**Manner of supervising the quality and performance of subject:** Public opinion

**COURSE LEADER'S CV:**
Professor dr. sc. Antun Brkić,
Clinic of Surgery, Orthopedics and Ophthalmology, University of Zagreb.

**See course G109.**

**Selected publications:**


G113. Antun Brkić:
TRAUMATIC INJURY AND OSTEOARTHRITIS

Duration (in hrs): 3 outline, 5 practical. Credits: 2,5.

Outline: Pathologic manifestation of joint disease in the athletse horse, classification of osteoarthritis in horses, Basic lesions of osteoarthritis and their pathogenesis, Articular cartilage Changes, Chip fractures, Patterns of joint disease in the most commonly affected joints of athletic horses, Carpal joint disease and carpal bone disease, Degenerative joint disease,

Practical: Clinical examination of bones and joints

Development of general and specific competences (knowledge and skills): After the lectures student can recognize painful joints in animals.


Recommended literature:

Manner of supervising the quality and performance of subject: Public opinion

COURSE LEADER'S CV:

162
Professor dr. sc. Antun Brkić,
Clinic of Surgery, Orthopedics and Ophthalmology, University of Zagreb.
See course G109.

Selected publications:

G114. Antun Brkić:
JOINT BIOMECHANICS IN THE PATHOGENESIS OF TRAUMATIC ARTHRITIS

Duration (in hrs): 4 outline, 2 seminar, 4 practical. Credits: 2.5.

Outline: Joint structure, Synovial Fluid, Synovial Membrane, Articular Cartilage, Subhondral Bone, Joint Stability, Soft Tissue Contribution in joint motion, Kinematics and Kinetics,
Practical: Clinical examination of joints, bones and soft tissue, Future Directions
Development of general and specific competences (knowledge and skills): Traumatic arthritis change the joint movement. Students are able to recognize stage of pathogenesis of mechanical arthritis.

Recommended literature:
Manner of supervising the quality and performance of subject: Public opinion

COURSE LEADER'S CV:
Professor dr. sc. Antun Brkić,
Clinic of Surgery, Orthopedics and Ophthalmology, University of Zagreb.
See course G109.

Selected publications:


G115. Antun Brkić:
PRINCIPLES OF THERAPY OF TRAUMATIC ARTHRITIS AND OSTEOARTHRITIS

Duration (in hrs): 3 outline, 2 seminar, 3 practical. Credits: 2,5.

Outline: Rest, exercise, and physical therapy programs, Rest, Passive and Active exercise, Physical therapy, Nonsteroidal anti-inflammatory drugs, Intra-articular corticosteroids therapy, Pharmacokinetics and Clinical applications some drugs.

Practical: Clinical examination of joint, Physical therapy programs

Development of general and specific competences (knowledge and skills): On the basis of previous knowledge students can recognize and apply different therapy in treatment of traumatic arthritis and osteoarthritis.


Recommended literature:


Manner of supervising the quality and performance of subject: Public opinion

COURSE LEADERS CV:
Professor dr. sc. Antun Brkić,
Clinic of Surgery, Orthopedics and Ophthalmology, University of Zagreb.
See course G109.

Selected publications:


G116. Antun Brkić:
CLINICAL FEATURES AND DIAGNOSIS OF EQUINE JOINT DISEASE

Duration (in hrs): 3 outline, 2 seminar, 5 practical. Credits: 2,5.
Outline: Clinical examination, Regional and intrasynovial anesthesia, Diagnostic arthroscopy, Synovial fluid analysis, Histopathology of synovial membrane biopsy

Practical: Clinical examination of joint, Puncture of joint, Laboratory examination of punctation, Biopsy of synovial membrane, Histopathology of synovial membrane

Development of general and specific competences (knowledge and skills): Lameness and other disturbances are the symptoms of joint disease in horse. Students have to learn how to locate the diseased joint.


Recommended literature:


Manner of supervising the quality and performance of subject: Public opinion

COURSE LEADER’S CV:
Professor dr. sc. Antun Brkić,
Clinic of Surgery, Orthopedics and Ophthalmology, University of Zagreb.
See course G109.

Selected publications:


**G117. Željko Cvetnić, Nenad Turk:**

Causative agents of specific infectious diseases of bacterial etiology (tuberculosis, brucellosis and glanders)

**Durations (in hrs):** total 15 (lectures 4, seminars 2, practical 9 school hours). Credits: 3,5.

**Outline:** Epizootiological meaning of specific infectious diseases of bacterial aetiology (tuberculosis, brucellosis and glanders). Demonstration of the prevalence of different kinds of mycobacteria and brucella in intensive and extensive breedings of cattle and swine. Isolation and identification of bacteria by use of molecular and traditional diagnostic methods. Application and comparison of different serological test in diagnosing specific infectious diseases. Tuberculosis: epidemiological meaning and distribution of *Mycobacterium tuberculosis* complex in cattle and other species of mycobacteria in swine. Demonstration of the disease *in vivo* with the use of tuberculin skin test and γ – IFN (gamma interferone test), isolation DNA of mycobacteria directly from the suspected material and culture, and identification of *Mycobacterium* spp., demonstration of *Mycobacterium tuberculosis* complex and different biovaries of *M. avium* complex by the use of polymerase chain reaction (PCR). Brucellosis: application of different serological methods and their comparison in brucellosis diagnostic in domestic animals and *B. ovis* infections in sheep. Identification of brucellas by polymerase chain reaction (PCR) – demonstration of appertaining to *Brucella* and to different kinds of *Brucella* spp. (by specific primers inside the insertion sequence IS711 the sequence of nucleotides characteristic for the species *B. abortus, B. melitensis, B. suis* and *B. ovis* would be demonstrated).

**Development of general and specific competences (knowledge and skills):** Students get acquainted with significant animal infectious diseases and their causative agents, which are pathogen for human too. They are acquired practical knowledge in isolation and identification, as well as microbiological, serological and genetically method of diagnosis.

**Recomended literature:**


Cvetnić Ž. (2000): Tuberkuloza i paratuberkuloza domaćih životinja, Hrvatski veterinarni institut Zagreb


**Examination:** Written.

**Manner of supervising the quality and performance of subject:** Based on the Statute of the University of Zagreb

**COURSE LEADER’S CV**

Željko Cvetnić, Ph.D., senior scientific collaborator,
Croatian Veterinary Institute Zagreb

Željko Cvetnić was born on 26 November, 1963 in Mraclin. He received his primary education in Mraclin and Vukovina and secondary in Zagreb (Secondary Veterinary School). In the academical year 1983/84 began his studie at the Veterinary Faculty University of Zagreb and graduated in 1990. In the same year he started to work in the Department for Immunology of the Veterinary Institute Zagreb where he was enabled to apply for post-graduating study in the field of «Microbiology and Epizootiolozy». In 1993 he commenced a M.Sc. degree by his topic «The Prevalence of Tuberculosis in the intensive Breeding of Swine in the Republic of Croatia». In 1996 he presented his doctoral thesis «Epizootiological Meaning of *Mycobacterium avium* complex and other Potential Pathogen mycobacteria in swine environment» and
obtained a doctor's degree. Until today, he alone or in collaboration with other investigators, published 92 bibliographic units. He also wrote three books «Tuberculosis and Paratuberculosis in Domestic Animals» and «Fundamentals of Swine Breeding in Family Husbandry» and he was a chief editor of the book «Brucellosis, Tuberculosis and Enzootic Leucosis in Cattle». As part of his professional improvement spent several months in the Institute for Health Protection of the Republic of Croatia, Department for Bacteriological Diagnostic Tuberculosis and stay for several weeks in France (AFFSA – OIE Reference Laboratory for Brucellosis, Tuberculosis and Paratuberculosis), in Slovenia (Veterinary Faculty Ljubljana – Department for Microbiology) and also in Spain (Universidad de Navarra and Zaragoza). Member of numerous commissions for electing of faculty teaching staff, PhD committees, as well for defending graduation thesis.

Selected Papers:


G118. D. Vujaklija, Andreja Ambriović Ristov: MOLECULAR PRINCIPLES OF GENETIC ENGINEERING

Duration (in hrs): total 30 (8 lectures, 10 seminars and 12 practical). Credits: 4,5.

Outline: Fundamental principles of recombinant DNA technology and methodology for manipulation of DNA molecules in vitro. Enzymes used in construction of hybrid molecules: restriction and other enzymes for joining DNA fragments. Main vectors for cloning and methods for introducing recombinant vectors in host cells (microbial, plant and animal cells). Plasmid (pBR233 and others) and viruses (lambda and derivatives) as vectors. Cloning in prokaryotes, (E.coli) plant and higher organisms (SV40 as vector). Introducing DNA by microinjection and other techniques. Transgenesis in mamals. Usefulness and advantages in obtaining products from genetically modified organisms, examples in microorganisms, plants and transgenic animals. Environment and ethical questions.

Colectures: dr. sc. D. Vujaklija, IRB, dr. sc. L. Jemeršić, Veterinary institute, Zagreb

Development of general and specific competences (knowledge and skills): Candidates get acquainted with possibilities of applying the methods of genetic engineering i veterinary immunology and infectology.

Recomended literature


Examination: written and oral

Manner of supervising the quality and performance of subject: Based on the Statute of the University of Zagreb

COURSE LEADER’S CV

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<th>G119.</th>
<th>Boris Habrun, Branka Šeol:</th>
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<td>ENTEROBACTERIACEAE AND OTHER INTESTINAL BACTERIAL PATHOGENS IN DOMESTIC ANIMALS</td>
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Duration (in hrs): total 15 (lectures 2 hours, seminars 4 hours and practical 9 hours). Credits: 3.5.

Outline: Enterobacteriaceae (E. coli, Salmonella spp) and other most common bacterial pathogens (Brachyspira hyodysenteriae) in gastrointestinal infections of domestic animals. Characteristics of diagnostic bacteriological media for the growth of the particular bacteria (basic nutritive media, enriched media, enrichment broths and selective media). Biochemical and serological identification. Detection and identification of Salmonella spp. and E. coli O157 with enzyme linked immunosorbent assay. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK). Detection of enterotoxins and verotoxin with ELISA. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK). Detection of enterotoxins and verotoxin with ELISA. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK). Detection of enterotoxins and verotoxin with ELISA. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK). Detection of enterotoxins and verotoxin with ELISA. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK). Detection of enterotoxins and verotoxin with ELISA. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK). Detection of enterotoxins and verotoxin with ELISA. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK). Detection of enterotoxins and verotoxin with ELISA. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK). Detection of enterotoxins and verotoxin with ELISA. Determining the adherence ability of bacterial strains to Green monkey kidney cell cultures (GMK).

Colectures: doc. dr. sc. Branka Šeol

Development of general and specific competences (knowledge and skills): Acquiring knowledge about microbiological, immunogenic and genetically properties of the most common causative agents of enteric diseases. During the course the candidate learn a lot of currently microbiological and genetic methods which can use in scientific work.

Recommended literature:

Examination: written

Manner of supervising the quality and performance of subject: Based on the Statute of the University of Zagreb

COURSE LEADERS CV

Boris Habrun PhD
Croatian veterinary institute Zagreb

He was born on December 14th 1966 in Zagreb, where completed primary and high school. He graduated at the Veterinary faculty of the University of Zagreb in July 15th 1993. During studies he published one work which received the University President's award in 1990. In January 1994 dr. sc. B. Habrun was employed by the Croatian Veterinarian Institute in Zagreb, in the Department of Bacteriology. During 1994 he took postgraduate studies in the Veterinary Faculty of University of Zagreb, field Microbiology and epizootiology. He received Master Degree on November 29th 1996 with research work: "Detection of antibodies in pig sera's against Actinobacillus pleuropneumoniae by application of ELISA and 2-mercaptoethanol microagglutination". In January 1998 he spent a month in the Institute for Veterinary Bacteriology University of Bern, Switzerland, on scientific and expert ieduation. He received PhD Degree on April 12th 1999 with dissertation: "Immunogenicity of ApxIVA toxin and detemination of genes encoding exotoxins of Actinobacillus pleuropneumoniae". In July 2002 he became a scientific collaborator. Today Dr. sc. B. Habrun works as a head of Department of Bacteriology in the Croatian Veterinarian Institute in Zagreb, conducting diagnostics of bacterial diseases of animals, especially pigs, and preventing
and treating bacterial diseases. Until now he have published more than 46 scientific and expert works, some of which (7) were published in international magazines (cited in Current Contents).

**Selected papers:**


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<th>G120.</th>
<th>Branka Šeol, Boris Habrun:</th>
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<td><strong>DIAGNOSTIC APPLICATIONS OF IMMUNOLOGICAL TESTS</strong></td>
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**Duration (in hrs):** Total 15 (lectures 2, seminars 3, exercises 10). Credits: 3.5.

**Outline:** Primary immunoassays: agglutination, passive agglutination, microscopic agglutination, viral hemagglutination and its inhibition; precipitation, immunodiffusion, radial immunodiffusion; complement fixation test. Immunofluorescence assays: direct fluorescent antibody tests, indirect fluorescent antibody tests, particle fluorescence immunoassays; immunoenzyme assays: microwell ELISA tests, Western blotting

**Coelectures:** Ivana Lojkić, dipl. Ing.; dr. sc. Željko Cvetnić, DVM

**Development of general and specific competences (knowledge and skills):** Candidate acquired theoretical and practical knowledge of using classical as well as modern immunological methods in scientific research.

**Recommended literature:**

Tizard Ian R. Veterinary Immunology, Sixth ed., 2000


**Exam:** written, practical

**Manner of supervising the quality and performance of subject:** Based on the Statute of the University of Zagreb

COURSE LEADER’S CV

Branka Šeol, DVM, PhD

Department of Microbiology and infectious diseases, Veterinary School, University of Zagreb

Born 1959. Zagrebu, 1984. Graduated on Veterinary school University of Zagreb; 1986. MSc in Veterinary pathology; 1997. PhD degree in Veterinary Microbiology. Employed at Veterinary School, Department of microbiology and infectious diseases. She is a leader of collegiums “Microbiological laboratory practice” in postgraduate study “Veterinary medicine, “Microbiology and epizootiology”. Fellowships: Moredun Research Institute, Edinburgh, Velika Britanija and Department of Agriculture for Northen Ireland, Veterinary Science Division, Belfast. Cooworker of main research prof. dr. sc. Tome Naglića in scientific research project “Mikoplasmosis and some infection diseases of nanimals”. She is involved in lecturing, laboratory diagnostics; especially interest of work: *Pseudomonas aeruginosa* and mycoplasmas.

**Selected papers:**


Naglić, Toma; Frey, Joachim; Hajsig, Danko; Busch, Kristina; Šeol, Branka. Epizootiological and microbiological study of infectious keratoconjunctivitis in sheep // COST 826, Agriculture and biotechnology, Mycoplasmas of ruminants: pathogenicity, diagnostics, epidemiology and molecular
Boris Habrun PhD
Croatian veterinary institute Zagreb, Savska cesta 143
See course G119.

Selected papers


Zvonimir Kozarić, Željka Matašin:
COMPARATIVE ANATOMICAL, HISTOLOGICAL AND PHYSIOLOGICAL CHARACTERISTICS OF IMMUNE SYSTEM IN ANIMALS

Duration (in hrs): total 30 (lectures 3, seminars 8, practical 19). Credits: 3,5.

Outline:
The organs and tissues of immune system. Structural specificity of immune system in domestic mammals. Avian immune system. Immune system and its characteristics in fish. Morphological and structural specificities of immune system in domestic animals, murids, birds and fish. Fish as a cold–blooded animals, e.g. vertebrates. Environmental in that is fish living – the most important parameters of water quality. The basic parts of fish anatomy and physiology. Lymphoid organs and tissues, metabolism, stress and common adaptive syndrome. Immune response capability. Specific characteristics of immunity of fish – non-specific and specific, hummoral and cellular immunity and non-lymphoid protection. Fish immunization Preparing and staining methods of histological preparations from some organs and tissues of immune system in animals. Staining methods of blood cells. Microscopy. The cells of mononuclear phagocyte system. The use of histochemical, immunological (immunofluorescence, immunoperoxidase) and genetic tests in scientific research. Mastocytes, Enzymatic methods in research associated with immune cells (alkali phosphatase, esterases, peroxidase, methacromasy).

Colecturers: prof. dr. sc. V. Delić, doc. Branka Šeol, doc. dr. Z. Milas, dr. sc. B. Habrun

Development of general and specific competences (knowledge and skills): Taking this course candidate for a doctor's degree is acquiring a complete knowledge about the structural and physiological specific quality of the organs and tissues of immune system in domestic mammals, avian and fish. He has been also introduced in preparation and staining of histological sections and recognition of immune cells.

Recommended literature:


Examination: written
Manner of supervising the quality and performance of subject: Based on the Statute of the University of Zagreb

COURSE LEADER'S CV
Doc. dr. sc. Željka Matašin
Department for Fish and Bees Biology and Pathology, Faculty of Veterinary Medicine, Heinzelova 55, 10000 Zagreb
See course G27.

Selected papers:

G122. Ljubo Barbić, Vilim Starešina:
ANIMAL INFLUENZA WITHIN PUBLIC HEALTH

Duration (in hrs): 30 (15 lectures, 5 seminar, 10 practice). Credits: 4,5.


Co – lecturers: Prof. Željko Županičić, PhD; Zoran Milas, PhD. Assist. Prof.; Željko Čač, PhD.; Vilim Starešina, PhD.; Nenad Turk, PhD., assist. Ljubo Barbić, DVM, Snježana Kovač, prof.

Development of general and specific competences (knowledge and skills):

Recommended literature

Selected scientific papers concerning field related courses.
Examination: written and oral

COURSE LEADER'S CV:

G123. Goran Bačić, Marijan Benić, Branka Šeol:
BACTERIAL MASTITIS IN COWS

Duration (in hrs): total 15 (lectures 2 hours, seminars 4 hours and practical 9 hours). Credits: 3,0.

Colectures: prof. dr. sc. Branka Šeol, dr. sc. Miroslav Benić

Development of general and specific competences (knowledge and skills): The students get acquainted with microbiological properties of bacterial causative agents of mastitis in cows. They learn how to grow and identify them with microbiological, serological and genetic methods, using the acquired knowledge in scientific research.

Recommended literature


Examination: written

Manner of supervising the quality and performance of subject: Based on the Statute of the University of Zagreb

COARSE LEADER’S CW

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**G124.** Branka Šeol, Ksenija Vlahović:

**MYCOPLASMA, COXIELLA AND CHLAMYDIA**

Duration (in hrs): total 16 (lectures 2, seminars 4, practical 10). Credits: 4,0.

Outline: *Mycoplasma*, *Coxiella* and *Chlamydia* as causative agents of infectious diseases in domestic mammals and birds, as well laboratory animals. Nutrient media and recovery of mycoplasmas from particular kinds of animals. Specificity of isolation and cultivation of coxiella and chlamydia. Identification of mycoplasma, coxiella and chlamydia. Biochemical characteristics in mycoplasma identification. Methods of etiological diagnosis of chlamydiosis according to O.I.E. standards: protocol (1) ELISA performance t (EIA) Clearview Chlamydia test, (2) cultivation of *Chlamydophila* spp. in developing chicken embryos, (3) the use of experimental animals (mice) in chlamydophyla isolation, (4) McCoy cell line of murine fibroblasts in cultivation of chlamydophila. The use of immunological reactions (CF-test, ELISA, immunufluorescence) and geneticall methods (PCR, RFLP-PCR) in epidemiological investigations.

Colecturers: prof. dr. sc. V. Delić, doc. Branka Šeol, doc. dr. Z. Milas, dr. sc. B. Habrun

Development of general and specific competences (knowledge and skills): During the course students has been trained in laboratory methods used in culturing and identification of these group of specific bacteria and diagnostic of the diseases caused by them.

Recommended literature:


Everett, K. D. E., R. M. Bush, A. A. Andersen (1999): Emendet description of the order Chlamydiales, proposal of Parachlamydiaceae fam. nov. and Simkaniaceae fam. nov., each containing one monotypic


Examination: written

Manner of supervising the quality and performance of subject: Based on the Statute of the University of Zagreb

COURSE LEADER'S CV

Doc. dr. sc. Ksenija Vlahović
Department of Biology, Faculty of Veterinary Medicine, University of Zagreb, Henzelova 55, Croatia, phone ++ 386 01 2390 145, fax: ++ 386 01 2442 390, e-mail: vlahovic@vef.hr

Home address: Gudci 45, Zagreb, Croatia; Birth date: 3rd January, 1966; Birth place: Zagreb, Croatia;
Education: Faculty of Veterinary Medicine, University of Zagreb; Postgraduate study in Microbiology, Faculty of Veterinary Medicine, University of Zagreb; Academic degrees and activities: 1992. D.V.M.; 1997. M.Sc.; 2000. Ph.D. 2003. Associate professor, Department of Biology; Membership and activities in professional association: Societas Veterinaria Croatica (HVD), Croatian Biological Society 1885 and World Poultry Science Association-Croatia (WPSA-CRO); Research experience: Participation in the 4 scientific project; Teaching activities: Undergraduate courses education in Biology. Selected chapters of botany (phitology) (facultative), Selected chapters of molecular biology (facultative); Educational texts: Selected chapters of botany (phitology) (Medicinska knjiga); Work Book in Biology for student Veterinary Medicine (Medicinska knjiga); Guide through garden of Veterinary Faculty in Zagreb (Medicinska knjiga); Immunology of domestic animals (CD);

Selected papers:


Dovč, P. Dovč, D. Keše, K. Vlahović, M. Pavlak, O. Zorman Rojs: Long-term study of chlamydophilosis in Slovenia. Veterinary Research Communications (u tisku)


Hrv. vet. vjesn. 26, 9-14.


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G125. Josip Madić, Lorena Jemeršić:
MOLECULAR VIROLOGY

Duration (in hrs): total 30 (lectures 5; seminars 5; practical 20). Credits: 4.0.

Outline: Virus isolation, identification and purification, viral DNA extraction, polymerase-chain reaction and reverse transcriptase-polymerase chain reaction (PCR and RT-PCR) methods for the detection of viruses, restriction endonuclease digestion of viral DNA, Western blotting test for measures of the proteins present in particular virus, viral genome DNA sequence analysis, principles of viral phylogeny, pathogenesis of viral diseases, viral genetics and evolution, mechanisms of viral oncogenesis, deletion mutants, immune response to viral infections, recombinat viral veterinary vaccines, viral taxonomy and nomenclature.

Co-lecturers: assoc. prof. Nevenka Biuk-Rudan, PhD; Lorena Jemeršić, PhD, Croatian Veterinary Institute; assist. prof. Vilim Staresina, PhD; Andreja Abriović-Ristov, PhD, Institut “Ruder Bošković”

Development of general and specific competences (knowledge and skills): The students will be competent to work in virological laboratory on virus isolation and identification, extraction and characterization of viral DNA or RNA. Further, the acquired knowledge leads the students to apply it in the scientific work, as part of methodology and elaboration of collected data.

Recommended literature:


Examination: oral exam

Manner of supervising the quality and performance of subject: Students’ judgement and criticism after finished course and completed study.

COURSE LEADER’S CV

Prof. dr. sc. Josip Madić

Department of Microbiology and Infectious Diseases, Faculty of Veterinary Medicine, University of Zagreb. Phone: 2390 206, Fax: 2441 390; E-mail: jmadic@vef.hr

Born February 25, 1952, in Ćukovec (Međimurje), Croatian citizen. Completed secondary school in Zagreb. Graduated in veterinary medicine from the Faculty of Veterinary Medicine, University of Zagreb 1979. Completed postgraduate study and defended Master of Science thesis in 1984. In 1989, completed PhD thesis entitled “Immunogenicity of inactivated canine parvovirus 2” from the Faculty of Veterinary Medicine University of Zagreb. He started as assistant professor at the Department of Microbiology with Parasitology of the Faculty of Pharmacy and Biochemistry, University of Zagreb in 1979, where he was included in the project designed for detection and identification of mycotoxins. In 1980, he moved to the Ambulatory Clinic of the Faculty of Veterinary Medicine University of Zagreb, and 1985 to the Department of Microbiology and Infectious Diseases. From 1989 to 1991 he worked as visiting research fellow in Central Veterinary Institute, Lelystad, The Netherlands, on the project “Bovine herpesviruses”. In 1997 he has been elected for full professor of Microbiology, and Veterinary Immunology at the Faculty of Veterinary Medicine University of Zagreb. In 1998 has been elected for associate member of of Croatian Academy of Sciences and Arts, and Croatian Academy of Medical Sciences. Published 56 scientific papers and 42 professional and review articles, 17 in journals indexed in CC, 61 abstracts from domestic and international congresses. Published 2 books as coauthor. Number of citations: approximately 200 SCI citations, and 7 citations in international books, and 2 in domestic books. Has been the leader of 2 scientific projects and coworker in 5. As coworker, he was included in discovering of 1st natural mutant of gE-bovine herpesvirus-1 strain, and described isotype-specific antibody responses in calves infected with bovine herpesvirus-1. He worked on isolation and identification of equine influenza viruses, and on the development of new vaccines against equine influenza, animal herpes- and parvoviruses. Has been included in the study of classical swine fever virus. He described nonmotile Salmonella abortusequiss strain. Has been a lecturer at the postgraduate courses Veterinary Immunology, and Virology. Has been a member of 10 scientific committees of congresses, and president of 2 committees. PhD thesis supervisor: 6, Master of Science thesis supervisor: 5. Editor-in-Chief of the scientific journal Veterinarski arhiv (2000-present). Member of advisory board of two journals. Vice-dean for Science at the Faculty of Veterinary Medicine 1995-1999, and 2003-present. National Board for Scientific Awards, Republic of Croatia 2001-present. Member of European Society for Veterinary Virology, Croatian Microbiological Society, Croatian Veterinary Society.
Selected papers:


Dr.sc. Lorena Jemeršič, dr.vet.med

Selected papers:


G126. Ljubo Barbić, Vilim Starešina: 
RETROVIRAL DISEASES OF DOMESTIC ANIMALS

Duration (in hrs): 24 (12 lectures, 4 seminars, 8 practical). Credits: 4.5.

Practical: Work in lab (security measures, protocol). Serological diagnosis (Coggins test, cELISA). EIA virus propagation on equine fibroblasts cell line (ED). Extraction and proof of viral DNA (nPCR).
Co-lecturers: Prof. Željko Župančić, PhD, Assist. prof. Zoran Milas, PhD, Nenad Turk, PhD, asist. Ljubo Barbić, DVM, Snježana Kovač, Prof., Dragica Živković, technical assistant

Development of general and specific competences (knowledge and skills):

Recommended literature:

Selected scientific papers concerning field related courses.

Examination: Written and oral

COURSE LEADER'S CV

Vilim Starešina, PhD
Department of microbiology and infectious diseases with clinic, Faculty of Veterinary Medicine University of Zagreb, Heinzeloova 55, Zagreb, Croatia, phone+385-1-2390-203, fax+385-1-2390-211, e-mail vilim.staresina@vef.hr

Born on January 5th 1960. in Karlovac. Completed elementary and secondary school in Zagreb. Graduated in 1987. at Faculty of Veterinary Medicine University of Zagreb. Upon graduation worked as an research assistant for the course Infectious diseases of domestic animals at Department of microbiology and infectious diseases with clinic, Faculty of Veterinary Medicine University of Zagreb. Earned MSc and PhD degree in 1998. and 2004., respectively. In year 2000. was at department Virologie et immunologie cellulaire, Institut Pasteur, Paris. Up to present day published 15 scientific papers and reviews. Member of Croatian Veterinary Society and Croatian Microbiology Society.

Selected publication:
Boris Habrun, Nenad Turk:  
**BACTERIAL INFECTIONS OF RESPIRATORY DISEASES OF DOMESTIC ANIMALS**

**Duration in hrs:**total 13 (lectures 3, seminars 2, practical 9). Credits: 3,5.


**Colectures:** Prof. dr. sc. Branka Šeol

**Development of general and specific competences (knowledge and skills):** Taking this course candidate for a doctor's degree is acquiring a complete knowledge about the bacterial and viral infections of the respiratory system of domestic mammals. He has been trained in microbilogical, immunologic and some genetic methods currently used in scientific research.

**Recommended literature:**

**Examination:** written

**Manner of supervising the quality and performance of subject:** Based on the Statute of the University of Zagreb

**COURSE LEADERS CV**

**Boris Habrun PhD**
Croatian veterinary institute Zagreb, Savska cesta 143

See course G119.

**Selected papers**
**Outline:** Standardized disk-diffusion, agar dilution, broth macrodilution, broth microdilution, and concentration gradient test (Epsilometer test). Isolated bacteria can also be screened for antimicrobial-modifying enzymes (chromogenic disk method-rapid procedure to detect β-lactamase). Genetic methods for assessing antimicrobial Resistance. Most genotypic methods include an initial step where the «target» nucleic acid is amplified usually by PCR. The product of PCR (amplimer or amplicon) can be confirmed as the desired target nucleic acid (part or all of a resistance-associated genetic material) by electrophoretic mobility determinations probe hybridization assays (Southern blotting of electrophoretic gels, slot, dot blot, enzyme-linked immunosorbent assay, or liquid hybridization formats), restriction fragment length polymorphism (RFLP) analysis, or DNA sequencing formats. Amplicons can also be assessed for specific mutations associated with antibiotic resistance by direct DNA sequencing methods and RFLP, single-strand conformation polymorphism (SSCP), dideoxy fingerprinting (ddF), Cleavase fragment polymorphism (CFLP), RNase cleavage, heteroduplex, line probe, molecular beacon, or microchip oligonucleotide array assays.

**Collectures:** mr. sc. Željko Kelnerić

**Development of general and specific competences (knowledge and skills):** Being acquainted with current microbiological and genetic methods, candidate acquires basic knowledge needed for scientifically research in the field of bacterial resistance

**Recommended literature:**
Brown, T. A. Gene Cloning, Blackwell Science Inc (October 2001)
Hames B. D., D. Rickwood, by Oxford University Press (March 2002)

**Manner of supervising the quality and performance of subject:** Based on the Statute of the University of Zagreb

**COURSE LEADER’S CV**
Branka Šeol, DVM, PhD
Department of Microbiology and infectious diseases, Veterinary School, University of Zagreb

**Selected papers**
Naglić, Tomo; Šeol, Branka; Crnić, Zrinka; Hajsig, Danko. Susceptibility of canine and feline Staphylococcus intermedius strains to different antimicrobial agents // Zbornik s programom - Proceeding with the program / Slovensko mikrobiološko društvo (ur.). Ljubljana : Slovensko mikrobiološko društvo, 1998. 146-147

**Boris Habrun PhD**
Croatian veterinary institute Zagreb, Savska cesta 143

**Selected papers:**


G129. Nenad Turk, Zoran Milas, Zvonko Modrić: ZOONOSES CAUSED BY SPIROCHETES (Leptospirosis, Lyme borreliosis, Intestinal spirochétosis)

Duration (in hrs): Total 34 (10 lectures, 20 practice and 4 seminars). Credits: 5,5.


Practical: Introduction. Safety measures in the laboratory (modes of contamination, safety measures, classification of spirochetes based on their possible danger to laboratory personnel). Sample specimens (sample collection for bacteriological, serological and molecular analysis). Sample conservation and transport. Transport of infectious samples. Laboratory protocols. Investigation of spirochetes by direct examination (microscopic examination using a dark field microscope, staining techniques). Investigation of spirochetes using culture techniques (culture media, culture methods, incubation of the cultures, observation of the cultures, strain maintenance and conservation). Handling with laboratory animals (inoculation of host animals, hiperimmunization, collection of samples). Serological techniques (introduction, microscopic agglutination test – MAT, cross agglutination absorption test – CAAT, macroagglutination on slide or TR test, immunofluorescence-IFA, enzyme linked immunosorbent assay-ELISA, monoclonal antibodies-Mab). Identification and characterization of spirochetes by molecular methods (DNA extraction, polymerase chain reaction-PCR, pulsed field gel electrophoresis-PFGE, restriction fragment length polymorphism-RFLP, phylogenetic analysis of sequences of 16S rDNA gene-sequencing).

(Seminars) Selected themes concerning etiology, epidemiology and ecology of spirochetosis.

Co-lecturers: Vilim Satrešina, PhD, DVM, asist. Ljubo Barbić, DVM, Nada Brkić, M Sc, DVM, Dragica Živković, technical assistant.

Development of general and specific competences (knowledge and skills):

Recommended literature:


Selected scientific papers concerning field related courses.

Examination: Written and oral.

COURSE LEADER'S CV'S:

Nenad Turk, PhD, DVM
Department of Microbiology and Infectious Diseases with Clinic, Faculty of Veterinary Medicine University of Zagreb, Heinzelova 55, ZAGREB, CROATIA phone: +385 1 2390 200, fax: +385 1 2390 211, e-mail: turk@vef.hr.
He was born on 16 December 1966 in Zagreb, Croatia. Primary and secondary school finished in Varaždin, Croatia. He was graduated at the Faculty of Veterinary Medicine University of Zagreb in 1993. M Sc degree obtained in 2000, and PhD in 2004. He was employed as a scientific assistant for course Infectious diseases of domestic animals at Department of Microbiology and Infectious Diseases with Clinic, Faculty of Veterinary Medicine University of Zagreb. He participates in routine and scientific investigation in Laboratory for leptospires, Faculty of Veterinary Medicine University of Zagreb. He spent his scientific training several times (1998-1999, 2000, 2002) in WHO referent center for leptospires, Institut Pasteur, Paris, France. He is a member of Croatian Veterinary Society (CVS), Croatian Veterinary Chamber (CVC), Croatian Microbiological Society (Secretary General 2001-2003) (CMS), International Leptospirosis Society (ILS).

Selected papers:

Zoran Milas, PhD, DVM
Department of Microbiology and Infectious Diseases with Clinic, Faculty of Veterinary Medicine University of Zagreb, Heinzelova 55, ZAGREB, CROATIA phone: +385 1 2390 200, fax: +385 1 2390 211, e-mail: zmilas@vef.hr.

He was born in 1957 in the Vinkovci, Croatia. Primary and secondary school finished in Zagreb, Croatia. He was graduated in 1982 at the Faculty of Veterinary Medicine University of Zagreb. M Sc degree obtained 1992, and PhD 1999 at Faculty of Veterinary Medicine University of Zagreb. From 1984-1986 he worked as field practitioner. From 1986-2003 he worked as assistant in course Infectious diseases of domestic animals and at Ambulatory clinic at Faculty of Veterinary Medicine University of Zagreb. From 2003 he works as a docent at Department of Microbiology and Infectious Diseases with Clinic, Faculty of Veterinary Medicine University of Zagreb. From 1986 he participates in routine and scientific investigation in Laboratory for leptospires, Faculty of Veterinary Medicine University of Zagreb. In 1991 he spent a training period in laboratories of Republic Institute for Public Health, Zagreb, Croatia. He is a member of Croatian Veterinary Society (CVS), Croatian Microbiological Society (CMS).

Selected papers:
G130. Tatjana Živičnjak: CLINICAL PARASITOLOGY

Duration (in hrs): 10 lectures, 7.5 practical. Credits: 2.5.

Outline: Lectures: Parasites as causative agents of diseases of the gastrointestinal tract and liver, respiratory tract, cardiovascular system, CNS and eye, life-threatening parasitic infections, parasites as dermatitis causative agents, the impact of parasitic infections on production and reproduction, interpretation of the parasitological investigation findings, zoonotic potential of animal ecto and endoparasites, diagnostics and differential diagnostics, therapy.

Parasitological stool examination, parasitological examination of the skin, parasitological examination of the blood smear, lymph node aspiration and parasitological examination of the aspirate, Knott’s technique and techniques for differentiation of microfilariae.

Recommended literature:
Infectious Diseases of the Dog and Cat, (ed. Craig E. Greene), W.B. Saunders Company

Examination: Written exam and practical examination

COURSE LEADER’S CV

Tatjana Živičnjak was born in Zagreb, Croatia on 1960. She graduated veterinary medicine at the Veterinary Faculty University of Zagreb, Croatia, and gained DVM on 1985. She became a teaching assistant at the Department of Parasitology and Parasitic Diseases where she 2004 gained PhD. Her current research interests include clinical parasitology, especially diagnostic procedures, prevention and therapy of animal parasitic diseases. She has also maintained an active interest in the research on diagnostic procedures, prevention, therapy and especially epizootiology on parasitic zoonoses leishmaniasis and dirofilariasis; moreover, investigation on the role of ectoparasites and endoparasites in dermatitis pathogenesis; diagnostic procedures, therapy and prevention of them.

Selected publications:
Stojević, D., T. Živičnjak, A. Marinculić, G. Marucci, A. Gašpar, M. Brstilo, P. Lučić, E. Pozio (2004): The epidemiological investigation of Trichinella infection i brown rats (Rattus norvegicus) and domestic pigs in Croatia suggests that rats are not a reservoir at the farm level. Journal of Parasitology, 90(3), pp. 666-670


<table>
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<tr>
<th>G131. Tatjana Živičnjak: VETERINARY IMPORTANT ARTHROPODS</th>
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<tr>
<td><strong>Duration (in hrs):</strong> 6 lectures, 4,5 practical. Credits: 2,5.</td>
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<tr>
<td><strong>Outline:</strong> Flies as vectors and molestants, bot flies, fleas, chewing and sucking lice, psoroptosis, choriotasis, nasal mites, demodicosis, otodectosis, sarcoptosis, notoedrosis, trixacarosis, knemidocoptosis, cheyletielosis, hard ticks, soft ticks, red chicken mite, insecticides, acaricides and repellents, zoonotic potential in animal ectoparasites. Practical classes (6) Morphology of flies, morphology of bot flies, finding the mites in the skin scrapings</td>
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<td><strong>Co-lecturers:</strong> dr.sc.Darko Sakar, dr.sc. Josip Madić, dr.sc. Marija Vučemilo, mr.sc. Sanja Bosnić, Relja Beck, dr.vet.med</td>
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<td><strong>Recommended literature:</strong> Medical and Veterinary Entomology (Ed. G. Mullen &amp; L. Durden), Academic Press Muller &amp; Kirk's Small Animal Dermatology (D.W. Scott, W. H. Miller, C. E. Griffin), W.B. Saunders</td>
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<td><strong>Examination:</strong> Written exam and practical examination</td>
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<td><strong>COURSE LEADER’S CV</strong> Tatjana Živičnjak See course G130.</td>
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G132.  Dagny Stojčević:

**SEROLOGICAL METHODS IN VETERINARY DIAGNOSTICS**

**Duration (in hrs):** 10 lectures, 10 practical. Credits: 4,5.


**Co-lecturers:** Albert Marinculić, Ph.D., professor, Zoran Milas, Ph.D., assistant professor, Relja Beck, VMD

**Recommended literature:**

Staak, C., Salchow, N. Denzin: Practical Serology from the Basics to the Tasting.


**Examination:** Written and practical.

**COURSE LEADER’S CV**

Dagny Stojčević, Ph.D.

_Department of Parasitology and Parasitic Diseases, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, tel. 01 2390361_

Dagny Stojčević, Ph.D., was born 1956., in Zagreb. She graduated at Faculty of Veterinary Medicine, University of Zagreb, in 1982. Ms.D. in 1987. and Ph. D. in 1999. Working experience: Teaching assistant at the Department of Parasitology and Parasitic Diseases, the Faculty of Veterinary Medicine, University of Zagreb since 1982. and research assistant since 1988. At the Department of Parasitology and Parasitic Diseases, she performs lectures and practical teaching for the graduates and postgraduates and is involved in science researches and projects. She performs parasitological diagnostics at Parasitological Laboratory and since 1999. is chief of the Laboratory for the Serological Diagnostics of Parasitological Diseases in Humans and Animals. Professional Affiliations: Member of Croatian Microbiology Society, Croatian Infectology Society and Croatian Veterinary Society.

**Selected publications:**


Stojčević, Dagny, T. Živičnjak, A. Marinculić, G. Marucci, A. Gašpar, M. Brstilo, P. Lucić, E. Pozio: The epidemiological investigation of Trichinella spiralis in brown rats (Rattus norvegicus) and domestic pigs in Croatia suggests that rats are not a reservoir at the farm level. Journal of Parasitology, 90,3, 666-670, 2004.
G133. Albert Marinculić
LABORATORY DIAGNOSTICS IN VETERINARY PARASITOLOGY

Duration: 10 lectures, 10 practicals. Credits: 3.0.

Outline: Lectures: faecal examination, skin examination, examination of respiratory organs, examination of the digestive system, examination of the neural system, blood examination, examination of the punctate and the byoptic material, histopathological examination, DNA detection
Practicals: direct faecal smear, qualitative coprological examination, flotation of wfggs and cysts, sedimentation, Baermann concentration, larvae cultivation, micrometry, quantitative coprological examination, interpretation, identification of helminths eggs, identification of cysts and oocysts, histopathological analysis, microfilarial identification

Development of general and specific competences (knowledge and skills): Upon completion of the course students will be acquainted with various parasitological diagnostic methods. The course will provide the competence to perform the parasitological diagnostics Students should be able to recognize different parasitic stages relevant for thea determination.

Co-lecturers: dr.sc. Dagny Stojčević, dr.sc. tatjana Živićnjak, Relja Beck, dr.vet.med

Recommended literature:
Bowman , D.D. Georgis Parasitology for Veterinarians, W.B. Saunders,1995

Manner of supervising the quality and performance of subject: Based on the Statute of the University of Zagreb

COURSE LEADERS CV
Albert Marinculić, Ph.D. Professor
Department of Parasitology and Parasitic Diseases, Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia, phone 01 2390 362, fax 01 2390 362, e-mail: albert@vef.hr

He was born in Mali lošinj,1961. He graduated at the Veterinary Faculty University of Zagreb in 1986. Ms.D. in 1988. and Ph.D. in 1991. Working experience: Teaching assistant at the Veterinary Faculty University of Zagreb, Associate Professor at the Veterinary Faculty in Zagreb, Professor at the Veterinary Faculty in Zagreb, Researc Fellow at the Agricultural Research Service, USDA, Beltsville, Department of Biology University of Texas at El Paso and Houston Medical Centre (Department of Physiology), Moredun Research Institute Edinburgh (British Council Scholarship), Istituto Superiore di Sanita Laboratorio de Parasitologia, Rome. From 1995. to 2003. Head of the Department of Parasitology and Parasitic Diseases). From 2003. to 2005. Head of the Centre for the Control of Trichinellosis at the Veterinary Faculty University of Zagreb. Vice Dean for the Education at the Veterinary Faculty University of Zagreb (2003-2005). Author or coauthor of 37 scientific papers ( 18 CC indexed) Project leader: USDA Project „Vaccination against trichinellosis in swine“, COST Acton 812 Croatia „Entomopathogenic nematodes“, Croatian Ministry of Science and TechnologyProject „Trichinellosis - Immunology and Immunopathology of the zoonose, Croatian Ministry of Science and Technology Project „New Diagnostics of Trichinellosis in Swine“. Undergraduate lecturing: Veterinary faculty University of Zagreb ( Parasitology and Parasitic Diseases, Parasitology in Public Health, Faculty of Natural Sciences and Mathematics ( Parasitology). Postgraduate lecturing: Parasitology( Veterinary Faculty University of Zagreb) Professional affiliations: Member of the International Commission for Trichinellosis, Member of the National Commission for the Trichinellosis, Member of the National Commission for the Fascioloidosis, Member of Croatian Immunological Society, President of the Croatian Veterinary Society, member of the Croatian Society of Infectology.

Selected publications:
G134. Albert Marinculic: PARASITIC ZOONOSES

Duration: 16 lectures, 4 practicals. Credits: 3,5.

Outline: Lectures: giardiasis, balantidiasis, cryptosporidiosis, toxoplasmosis, leishmaniasis, babesiosis, neurocysticercosis, echinococcosis, dypilidiosis, coenurus, sparganosis, fascioliasis, OLM and VLM syndrome, cutaneous larva syndrome, stronyludosis, anisakiasis, trichinellosis, dirofilariosis, uncommon human infections caused by animal parasites, ticks and mites as vectors of human parasitic diseases, insects as vectors of human parasitic diseases

Practicals: parasitological stool examination, parasitological examination of the blood, parasitological examination of the tissue.

Development of general and specific competences (knowledge and skills): This course will introduce students to the broad field of parasitic zoonoses that are transmitted from animals to man and vice versa. Students will gain knowledge about diseases and will be able to recognize the risk of handling animals during his practice and research work.


Manner of supervising the quality and performance of subject: Based on the Statute of the University of Zagreb

COURSE LEADERS CV

Albert Marinculic, Ph.D. Professor
Department of Parasitology and Parasitic Diseases, Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia, phone 01 2390 362, fax 01 2390 362, e-mail: albert@vef.hr

See course G133.

Selected publications:


**G135.** **Frane Božić:**
**IMMUNOPARASITOLOGY**

**Duration (in hrs):** 18 lecturers, 8 practical, 4 seminars). Credits: 4,5.

**Outline:** Lecturers: Basic principles of immunoparasitology. Parasitic antigens presentation. Cell-mediated and humoral immunity induced with protozoan parasites. Cell-mediated and humoral immunity induced with helminths. How parasites evade the immune responses (immune regulation by parasites). The role of cytokine network in protection against parasitic infections and in immunopathology. Parasites and allergy. Possibility for specific immunoprotection against parasitic infections (vaccination against parasitic diseases).

Practical: ELISA, dot-ELISA, immunofluorescence, flow cytometry, RT-PCR.

Seminars: Conversable model of seminars depending on students wishes.

**Development of general and specific competences (knowledge and skills):** The main goal of the «Immunoparasitology» is that students will be able to understand immunological and immunopathological mechanisms of parasitic infections. This knowledge can be used in lab diagnostic procedure and in clinics as well. In addition, those who are interested in research will be able to plan and design experiments attempting to develop so needed vaccines against parasitic diseases. Based on knowledge achieved during the study in particular of immunopathological mechanisms involved in parasitic diseases, clinicians will be able to better and more rationale cure each specific parasitic disease.

**Co-lecturers:** Relja Beck, D.V.M., research assistant; Albert Marinculić, D.V.M., PhD, full professor; Ivica Valpotić, BSc, PhD, full professor

**Recommended literature:**


Examination: written/oral (depending on students wishes)

Manner of supervising the quality and performance of subject: Supervisor of quality of lectures, practical work and seminars will be just students.

COURSE LEADER'S CV
Frane Božić, D.V.M., PhD, assoc. prof.
Department of Pharmacology &Toxicology, Veterinary faculty University of Zagreb, Heinzelova 55, 10000 Zagreb, tel. 01 2390 163, fax 01 2441 390, e-mail: frane.bozic@vef.hr

He was born in Zadar, July 03 1964. He finished basic education in Zadar and graduated in 1992 veterinary medicine on Veterinary Faculty University of Zagreb («Biological characterization of parasites Trichinella spp.»), he got Master of Science degree in 1996 on Faculty of Natural Science and Mathematics University of Zagreb («Intraepithelial T-lymphocytes in reaction against intestinal nematodes (Trichinella spiralis)») and he defended his PhD thesis («Immunomodulatory effect of levamisole in weaned pigs orally vaccinated with live vaccine against colibacillosis ») in 2000 on Veterinary faculty University of Zagreb. Working experience: Young researcher on scientific project financed by Croatian Ministry of Science 3-03-301 (“Trichinellosis: immunology and immunopathology of zoonose”) at the Department of Parasitology Veterinary Faculty University of Zagreb (1992.-1996.); assistant (1996.-2003.) and assoc. professor (2003.-) at the Department of Pharmacology and Toxicology Veterinary Faculty University of Zagreb. He was Research fellow in World Referral Center for Trichinellosis in Istituto Superiore di Sanità, Rome, Italy (2000/2001). He participated on numerous National/International congresses, with more than 20 oral presentations and in 2003 on The 9th International Congress of the EAVPT held in Lisbon, Portugal his oral presentation of scientific work entitled «Levamisole stimulates intestinal T cell-mediated immune responses of weaned pigs to vaccination against colibacillosis » was selected as the best one. He was actively participated as researcher (and/or still participates) in realization of more than 10 scientific projects. He currently teaches on graduate and postgraduate subjects on Veterinary and Medical Faculties University of Zagreb. Professional Affiliations: Member of editorial board of Journal Croatian Veterinary Record, head of board for graduated thesis, mentor for students, and member of board for informatics. Also, he is member of Croatian Immunological Society, Croatian Veterinary Society, Croatian Microbiological Society, and Croatian Toxicological Society.

Selected publications:


G136. Željko Grabarević:
VETERINARY ONCOLOGY

Duration (in hrs): total 60 (20 lectures, 40 practical). Credits: 4.0.


Development of general and specific competences (knowledge and skills): This subject introduces students to the comprehensive study of the oncology and all its aspects, and besides scientific work, enables good quality professional work in that field which is one of the most important prerogatives for all scientific work in the field of comparative veterinary oncology.

Co-lecturers: prof. dr. sc. Mensur Šehić, prof. dr. sc. Vladimir Butković, doc. dr. sc. Dražen Matičić, doc. dr. sc. Damir Žubić

Recommended literature:

Examination: written, practical work

Manner of supervising the quality and performance of subject: Quality assessment will be performed according to the University regulations.

COURSE LEADER'S CV
Željko Grabarević, Ph.D. Professor of Pathology
Department of general pathology and pathological morphology of the Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia. Phone +385 1 2390313, e-mail: zgrabar@vef.hr

Biographical data: born 1956, Mostar; Education: D. V.M., Mr.sc., Ph.D., Veterinary Faculty Zagreb, field of pathological anatomy; Employment: Professor and Head of the Department of General Pathology and Pathological Morphology at the Veterinary Faculty Zagreb; Summary of research activity: Experimental
gastrointestinal diseases especially inflammatory bowel disease and ulcer disease; neoplastic diseases of the dogs and cats; tumor immunohistochemistry, gizzerosine effects; Memberships and awards: European Society of Veterinary Pathology, European Society of Veterinary Clinical Pathology, New York Academy of Sciences, Croatian Veterinary Association, Award for the contribution to the field of comparative pathology prof. dr. Ljudevit Jurak; Publications: main editor of the official journal of the Croatian Veterinary Association – Croatian Veterinary Record; more than 150 publications among which 43 were published in the CC indexed journals; four books and textbooks in the field of pathological anatomy.

Selected publications:

G137. Željko Grabarević: THE BASICS OF IMMUNOHISTOCHEMICAL METHODS

Duration (in hrs): total 30 (10 lectures, 20 practical). Credits: 4.5.


Development of general and specific competences (knowledge and skills): Students would learn how to perform and how to understand and estimate the results of the immunohistochemistry techniques which is for scientific work in the field of Pathology one of the most important techniques.

Co-lecturers: Branka Artuković, Ph.D., ing Ivana Kranželić

Recommended literature:
Examination: written, practical work

**Manner of supervising the quality and performance of subject:** Quality assessment will be performed according to the University regulations.

**COURSE LEADER’S CV**
Željko Grabarević, Ph.D. Professor of Pathology
Department of general pathology and pathological morphology of the Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia, Phone +385 1 2390313, e-mail: zgrabar@vef.hr

See course G136.

**Selected publications:**


**Development of general and specific competences (knowledge and skills):** It is very important for students to learn about normal cell and then learn about cellular injury and definitively lethal injury. Therefore, this course is basis for clinical subjects.

**Co-lecturers:** Prof.dr.sc. Željko Grabarević, prof.dr.sc. Ante Hraste, mr sc.Mirna Robić

**Recommended literature:**


**Examination:** Written examination.

**Manner of supervising the quality and performance of subject:** according to the Statute of the University of Zagreb.

**COURSE LEADER'S CV**
Ruža Sabočanec, Ph. D. Professor of Pathology.
Department of general pathology and pathological morphology at University of Veterinary Medicine, Zagreb, Croatia. Heinzelo va 55, tel. 01 2390 311, E-mail: ruza.sabocanec@ vef.hr

Born 01.06.1947 in Donja Dubrava, Medimurje, RH. Nationality: Croatian. Graduated 1964 at gymnasium in Čakovec. Year 1971-1972 works as laboratory assistant at Veterinary Surgery Clinic. Year 1972 gained bachelor's degree at university of Veterinary Medicine, Zagreb, Croatia. Year 1977 masters degree at University of Veterinary Medicine, Zagreb, Croatia. Year 1988 PhD at University of Veterinary Medicine, Zagreb, Croatia. 1990-1991 resident at Rayne Institute, «St. Thomas Hospital», London, England. Project «Mechanism of pathogenesis of nervous system viral diseases». Works as assistant from 1972 to 1979 at Department of pathology and pathological morphology. 1979 becomes scientific assistant, 1988 becomes assistant professor at Department of pathology and pathological morphology, Zagreb Croatia. In 1996 she becomes associated professor at same department, and 2000 finally becomes full professor. She teaches to undergraduate and postgraduate studies at University of Veterinary Medicine in Zagreb. Field of special interest: vascular pathology of urban dogs, pathology of laboratoy animals, disease, control and health monitoring of rabbits in intensive production. Until now head of two scientific projects financed by Ministry of Science and Technology in Croatia. She is an member of Croatian Veterinary Association, Croatian Biological Association, Croatian Immunological Association, Association of European
Pathologists. Member of International «LJudevit Jurak» Comparative Pathology Symoposium, Secretary of Organising Committee of «LJudevit Jurak» Symposium, Acticve participant at number of international congresses in Croatia and abroad (Zagreb, Vienna, Copenhagenm, Pecs, Kaposvar, Bled). Published 9 scientific articles in CC and over 35 articles in other publications.

Selected publications:


G139. Ruža Sabočanec:

BASIC PATHOLOGY - DISTURBANCES OF CIRCULATION

Duration (in hrs): total 25 (lectures 10, practical 15). Credits: 3.5.


Development of general and specific competences (knowledge and skills): When discussing pathology of circulatory disorders, it is very important to mention that practically every pathological process includes disturbances of circulation. Students are thought the mechanism of circulatory disorder development which can have local and systemic components. That relays to knowledge of circulatory disorders-systemically and individual organs. Students can also use what they learn here for scientific purpose, especially for clinical research. That will include disorders of protein metabolism, inflammatory processes, malignant proliferations and hypoxia. It is of great importance to mention that all aforementioned pathological processes include local circulatory disturbances: thrombosis, infarction, embolism, hyperaemia, haemorrhagia and edema.
Co-lecturers: Stipica Curic, PhD, professor, Branka Artukovic, PhD assistant, mr.sc. Mirna Robić

Recommended literature:
Colman RW: Disseminated intravascular coagulation due to sepsis, Semin Hematol 31 (suppl 1): 10-17, 1994.

Examination: Written and oral exam

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb.

COURSE LEADER'S CV
Ruža Sabočanec, Ph.D. Professor of Pathology.
Department of general pathology and pathological morphology at University of Veterinary Medicine, Zagreb, Croatia. Heinzelova 55, tel.01 2390 311, E-mail: ruza.sabocanec@ vef.hr
See course G138.

Selected publications:
ENVIRONMENT

**Duration (in hrs):** 25 (lectures 10, practical 15). Credits: 3,5.


**Development of general and specific competences (knowledge and skills):** Candidates that start this course will learn specific diseases, nature and causes of disease, interactions between environment and diseases. This is an interdisciplinary subject which will enable students to reach final diagnosis.

**Co-lecturers:** Branka Šeol, PhD, professor, Lidija Vlahović, PhD professor assistant, Marina Pavlaka PhD assistant.

**Recommended literature:**

**Examination:** Written and oral exam.

**Manner of supervising the quality and performance of subject:** according to the Statute of the University of Zagreb.

**COURSE LEADER'S CV**
Ruža Sabočanec, Ph. D. Professor of Pathology.
Department of general pathalogy and pathological morphology at University of Veterinary Medicine, Zagreb, Croatia. Heinzellova 55 , tel.01 2390 311, E-mail : ruza.sabocanec@ vef.hr
See course G138.

**Selected publications:**


**G141.** Branka Artuković

**PATHOGENESIS OF THE INFECTIOUS AND PARASITIC DISEASES**

**Duration (in hrs):** 6 lectures, 2 seminars and 2 practical. Credits: 2.5.


**Development of general and specific competences (knowledge and skills):** Introduction to factors important in pathogenesis, spreading inside the organism and the development of prionc, viral, bacterial, protozoal and parasitic diseases.

**Co-lecturers:** Prof. dr. sc. Ruža Sabočanec, doc. dr. sc. Zoran Milas, dr. sc. Vilim Starešina, dr. sc. Nenad Turk.

**Recommended literature:**

Examination: Oral exam.

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb.

COURSE LEADER’S CV

Ruža Sabočanec

PATHOMORPHOLOGY OF ENVIRONMENTAL, TOXICOLOGIC AND NUTRITIONAL DISEASES

Duration (in hrs): 14 lectures, 4 seminars and 2 practical. Credits: 3,5.


Development of general and specific competences (knowledge and skills): Introduction to pathogenesis and the morphology of pathologic changes caused by environmental pathogens.

Co-lecturers: Prof. dr. sc. Boris Krsnik, prof. dr. sc. Darko Sakar, doc. Dr. sc. Nora Mas

Recommended literature:


Examination: Oral exam.

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb.

COURSE LEADER’S CV

Branka Artuković

GENETIC DISEASE OF THE ANIMALS
Duration (in hrs): 8 lectures and 2 practical. Credits: 2,5.


Development of general and specific competences (knowledge and skills): Introduction to basic genetic disorders inducing specific diseases developed after birth.

Co-lecturers: Doc. dr. sc. Snježana Vuković, doc. dr. sc. Maja Popović, doc. dr. sc. Ksenija Vlahović

Recommended literature:


Examination: Oral exam.

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb.

COURSE LEADER’S CV

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Duration (in hrs): 8 lectures and 2 practical. Credits: 2,5.


Development of general and specific competences (knowledge and skills): Introduction to basic genetic disorders inducing specific diseases developed after birth.

Co-lecturers: Doc. dr. sc. Snježana Vuković, doc. dr. sc. Maja Popović, doc. dr. sc. Ksenija Vlahović

Recommended literature:


Examination: Oral exam.

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb.

COURSE LEADER’S CV

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Duration (in hrs): 8 lectures and 2 practical. Credits: 2,5.


Development of general and specific competences (knowledge and skills): Introduction to basic genetic disorders inducing specific diseases developed after birth.

Co-lecturers: Doc. dr. sc. Snježana Vuković, doc. dr. sc. Maja Popović, doc. dr. sc. Ksenija Vlahović

Recommended literature:


Examination: Oral exam.

Manner of supervising the quality and performance of subject: according to the Statute of the University of Zagreb.

**Development of general and specific competences (knowledge and skills):** Introduction to congenital and acquired immunological disorders inducing specific diseases.

**Co-lecturers:** Prof. dr. sc. Ljiljana Bedrica, dr. sc. Branka Artuković

**Recommended literature:**


**Examination:** Oral exam.

**Manner of supervising the quality and performance of subject:** according to the Statute of the University of Zagreb.

**COURSE LEADER’S CV**

<table>
<thead>
<tr>
<th>G145.</th>
<th>Vladimir Mrljak:</th>
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<tr>
<td>LABORATORY DIAGNOSTIC AND CLINICAL APPROACH TO HEMOSTATIC DISEASES</td>
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</table>

**Duration (in hrs):** 10 lectures, 3 practical, 2 seminars. Credits: 3,5.


Practical: Coagulometric measurement, laboratory tests in cases of hemophilia A, hemophilia B and von Willebrand's disease.

Seminars: Interpretation of results in different hemostatic disorders.
Development of general and specific competences (knowledge and skills): After the course of Laboratory diagnostic and clinical approach to hemostatic diseases student should be able to do following skills: meaning and potential of laboratory diagnostic and clinical approach of hemostatic diseases; connect the content of subject with previous knowledge from physiology and pathophysiology with critical view on diseases of hemostasis; understand to interpret results of different hemostatic disorders; know to recognize the symptoms of hemostatic disorders.

Recommended literature:

Examination: oral

Manner of supervising the quality and performance of subject: Student opinion poll.

COURSE LEADER'S CV
Prof. dr. Vladimir Mrljak
Clinic of Internal Diseases with Chair for Kinology, Faculty of Veterinary Medicine, Heinzelova 55, Zagreb, Croatia, Phone. 01 2390 346, fax. 01 244 1390, e-mail: vmrljak@vef.hr

He was born in Karlovac, 1958. He finished Faculty of Veterinary Medicine, University of Zagreb in 1984. Ms. D. In 1991, and PhD in 1995. Working experience: Veterinary Technology in "Primarna proizvodnja Karlovac" (1984-1986), Assistant at Clinic for Internal Diseases with Chair for Kinology, Faculty of Veterinary Medicine (1987-1995), Assistant Professor at Clinic for Internal Diseases with Chair for Kinology, Faculty of Veterinary Medicine (1996-2000), Associated Professor at Faculty of Veterinary Medicine (2000- till now), Head of Clinic for Internal Diseases with Chair for Kinology, Faculty of Veterinary Medicine (2001- till now). Postgraduate lecturing: Faculty of Veterinary Medicine University of Zagreb. Professional Affiliations: Member of International Society of Animal Clinical Biochemistry, Croatian Veterinary Society.

Selected publications:
G146. Vladimir Mrljak: ACUTE PHASE PROTEINS - MARKERS OF INFECTION AND INFLAMMATION

Duration (in hrs): 9 lectures, 2 practical and 1 seminars. Credits: 3.5.


Co-lecturers: PhD. Vesna Matijatko

Development of general and specific competences (knowledge and skills): After the course of Acute Phase Proteins – Markers of Infection and Inflammation student should be able to do following skills: meaning and potential of acute phase proteins as a markers of infection and inflammation in veterinary medicine; connect the content of subject with previous knowledge from physiology and pathophysiology with critical view on acute phase proteins; the function of acute phase proteins and pathophysiology mechanisms in different diseases; with their control and application get an insight into health of the animals.

Recommended literature:


Examination: oral

Manner of supervising the quality and performance of subject: Student opinion poll.

COURSE LEADER'S CV

Prof. dr. Vladimir Mrljak
Clinic of Internal Diseases with Chair for Kinology, Faculty of Veterinary Medicine, Heinzelova 55, Zagreb, Croatia, Phone. 01 2390 346, fax. 01 244 1390, e-mail: ymrljak@vef.hr

See course G145.

Selected publications:

G147. Vladimir Mrljak:
BICHEMICAL METHODS: APPLICATION IN CLINICAL PRACTICE

Duration (in hrs): 8 lectures, 3 practical, 3 seminars. Credits: 3.5.


Seminars: Results of biochemical tests - discussion

Development of general and specific competences (knowledge and skills): After the course of Acute Phase Proteins – Markers of Infection and Inflammation student should be able to do following skills: meaning and potential of acute phase proteins as a markers of infection and inflammation in veterinary medicine; connect the content of subject with previous knowledge from physiology and pathophysiology with critical view on acute phase proteins; the function of acute phase proteins and pathophysiology mechanisms in different diseases; with their control and application get an insight into health of the animals.

Recommended literature:


L. Martin. Are you really need to know to interpret arterial blood gases, Lippincott williams and wilkins, Baltimore, 1999.

Examination: oral

Manner of supervising the quality and performance of subject: Student opinion poll.

COURSE LEADER'S CV
Prof. dr. Vladimir Mrljak
Clinic of Internal Diseases with Chair for Kinology, Faculty of Veterinary Medicine, Heinzelova 55, Zagreb, Croatia, Phone. 01 2390 346, fax. 01 244 1390, e-mail: vmrljak@vef.hr

See course G145.

Selected publications:


**G148.**

**Damir Žubčić:**

**MONITORING OF ENERGETIC AND METABOLIC STATUS OF DAIRY COWS, GOATS AND SHEEPS**

**Duration** (in hrs): 10 lectures, 10 practical and 4 seminars. Credits: 3.0.

**Outline:** Lectures: Introduction to metabolism. Role of constitution. Stress as an important factor in dairy production. Quantitative and qualitative influence of nutrition on metabolism. Importance of body condition. Negative energetic balance. Energetic requirements in transitional stages of gravidity, weaning...


Co-lecturers: Antun Brkić, Ph.D., full professor, Darko Gereš, Ph.D., assistant professor, Ivica Harapin, Ph.D., assistant professor

Development of general and specific competences (knowledge and skills): knowledge about homeostasis and homorrhesis in dairy cattle, negative energy balance, importance of production cycles in dairy animals, prevention and treatment of metabolic disorders.

Recomended literature:
Smith, B.P. : Large animal internal medicine, III edition, Mosby, St. Louis, 2002.

Examination: Oral exam with practical part on dairy farm.

Manner of supervising the quality and performance of subject: student inquiry.

COURSE LEADER'S CV
Damir Žubčić, Ph.D., assistant professor
Clinic for Internal Diseases with Collegium of Cynology, Faculty of Veterinary Medicine, University of Zagreb, Heinezelova 55, 10000 Zagreb, Croatia. Phone: +38512390349, fax: +38512390176, e-mail: dazubcic@vef.hr

Born in Karlovac, 1959. Elementary and high school in Karlovac, finished study of veterinary medicine on Faculty of Veterinary Medicine, University of Zagreb, in 1984. Work experience: professional collaborator and assistant on Faculty of Veterinary Medicine in Zagreb, from 1985 to 1986 and from 1991 to 1997. Professional collaborator of the Institute for agriculture and tourism in Poreč from 1987 to 1990. Veterinarian of the Veterinary station Rijeka from 1997 to 1998. From year 2002 to present assistant professor at the Faculty of Veterinary Medicine in Zagreb. Scientific and educational field of interest: ruminant metabolism. Special interest for the application of holistic veterinary medicine in maintaining herd health on ecological farms. Lecturer at graduate and postgraduate studies at the Faculty of Veterinary Medicine in Zagreb and Polytechnic Karlovac. Member of the International Veterinary Acupuncture Directory, Veterinary Botanical Medicine Association, International Goat Association, Croatian association for natural, energetic and spiritual medicine and of Croatian Veterinary Association (president of the Holistic Department).

Selected publications:

204
G149. Dalibor Potočnjak: INFLAMMATORY BOWEL DISEASE IN DOGS AND CATS

Duration (in hrs) 8 lectures, 4 practical. Credits: 2.5.

Outline: Introduction of students of the PhD program with etiology, clinical signs, diagnostic methods and management of dogs and cats with inflammatory bowel disease (IBD). Introducing with the most common types of IBD in dogs and cats (lymphocytic-plasmacytic enteritis and colitis, eosinophilic gastroenterocolitis, chronic histiocytic ulcerative colitis and suppurative colitis).

Practical: clinical cases

Development of general and specific competences (knowledge and skills): Knowledge from specific field of the gastroenterology of dogs and cats, practical basic knowledge in endoscopic examination of the gastrointestinal tract.

Recommended literature:

Examination: oral

Manner of supervising the quality and performance of subject: public opinion

COURSE LEADERS’S CV
Doc. Dr. sc. Dalibor Potočnjak
Clinic of Internal Diseases with Chair of Cynology, Faculty of Veterinary Medicine, Heinzelova 55, Zagreb, Croatia, Phone 01 2390347


Selected publications:
Laboratory Diagnostic Internal Diseases

**Duration (in hrs):** total 8 (lectures 3, practical 5). Credits: 2.5.

**Outline:**
- Hemopoiesis – Complete Blood Count. Biochemical evaluations of endocrinology disorders, metabolic disorders, disorders of gastrointestinal System, Lyvere, Pancreatic function, etc.

**Co-lecturers:** Mr. sc. Damjan Gračner, Jadranka Foršek, Dipl. Ing.

**Development of General and Specific Competences (Knowledge and Skills):** Student is able to interpretate blood tests on the basis of data and conclude which organic system is in failure and target possible diagnoses.

**Recommended Literature:**

**Examination:** oral during semester and written at the end of semester

**Manner of Supervising the Quality and Performance of Subject:** Public opinion


G151. Ljiljana Bedrica:

**VETERINARY HEMATOLOGY AND BLOOD TRASFUSION**

**Duration (in hrs):** Total 8 (lectures 3, practical 5). Credits: 2,5.

**Outline:** Evaluation of Bone Marrow function, Anemias, Transfusion therapy, Erythrocytosis, Leukopenia and Leukocytosis, Combined Cytopenias and Leukoerythroblastosis, Disorders of Hemostasis, Lymphadenopathy and Splenomegaly, Hyperproteinemia,

Practical: Complete Blood Counts – Blood Smear Analysis – Determination blood groups in dogs and cats, Citology of Bone Marrow
Seminars: Transfusion reactions

**Development of general and specific competences (knowledge and skills):** Student is able to interpretate blood tests on the basis of data and conclude which organic system is in failure and target possible diagnoses

**Co-lecturers:** mr. sc. Damjan Gračner, Jadranka Foršek, dipl. ing.

**Recommended literature:**


**Examination:** oral during semester and written at the end of semester

**Manner of supervising the quality and performance of subject:** public opinion

COURSE LEADER’S CV

Ljiljana Bedrica, Ph.D.

Clinic for Internal Diseases with Collegium of Cynology, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, 10000 Zagreb, Croatia.

See course G150.

**Selected publication:**


G152. Ljiljana Bedrica:
RESPIRATORY TRACT DISORDERS

Duration (in hrs): Total 7 (lectures 3, practical 4). Credits: 2,5.

Outline: Disorders of the Nasal Cavity, Disorders of the Larynx and Pharynx, Disorders of the Trachea and Bronchi, Disorders of the Pulmonary Parenchyma, Disorders of the Pleural Cavity,
Practical: Clinical evaluation of respiratory tract disorders, Radiography
Seminars: Pleural effusion, Pneumothorax, Oxygen supplementation

Development of general and specific competences (knowledge and skills): Student is able to interpretate tests on the basis of data and conclude which organic system is in failure and target possible diagnoses

Co-lecturers: Prof. dr. sc. Vladimir Butković, mr. sc. Damjan Gračner

Recomended literature:

Examination: oral during semester and written at the end of semester

Manner of supervising the quality and performance of subject: public opinion

COURSE LEADERS CV
Ljiljana Bedrica, Ph.D.
Clinic for Internal Diseases with Collegium of Cynology, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, 10000 Zagreb, Croatia.

See course G150.

Selected publication:


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**G153.** Ljiljana Bedrica:
MYOCARDIAL AND ENDOCARDIAL DISEASES OF THE DOGS AND THE CATS

**Duration (in hrs):** Total 7 (lectures 3, practical 4). Credits: 2,5.

**Outline:** Dilated cardiomyopathy, Hypertrhophic cardiomiopathy, Myocarditis, Arterial thromboembolis in the cats, Degenerative mitral and tricuspid valve disease, Practical: Electrocardiography, Radiography, Ultrasonography Seminars: Clinical Evaluation of Cardiovascular System and EKG

**Development of general and specific competences (knowledge and skills):** Student is able to interpretate tests on the basis of data and conclude which organic system is in failure and target possible diagnoses

**Co-lecturers:** Doc. dr. sc. Damir Stanin, mr. sc. Damjan Gračner

**Recommended literature:**

**Examination:** oral during semester and written at the end of semester

**Manner of supervising the quality and performance of subject:** public opinion

COURSE LEADER'S CV
Ljiljana Bedrica, Ph.D.
Clinic for Internal Diseases with Collegium of Cynology, Faculty of Veterinary Medicine, University of Zagreb, Heinzelnova 55, 10000 Zagreb, Croatia.

See course G150.

**Selected publication:**


Gregurić-Gračner, G., V. Vučevac Bajić, V. Hahn, Lj. Bedrica, I. Harapin, D. Gračner (2004): Instruments used in diagnosing internal diseases exposed in Veterinary Faculty University of Zagreb Museum as a...


G154. Ljiljana Bedrica:
CLINICAL NUTRITION OF THE DOG AND CAT

Duration (in hrs): 5 lectures, 1 seminar. Credits: 2,5.

Outline:
Balanced diet, Clinical Nutrition in Practice: Gastrointestinal Tract Disease, Hepatic Disease, Urinary Tract Disease, Cardiovascular Disease, Endocrine Disease, Skeletal Disease, Skin Disease, Obesity, Nutrition and Cancer

Seminars: Feeding Hospitalised Dogs and cat

Development of general and specific competences (knowledge and skills): On their own students after the course can conclude which system is in failure. On dana basis can choose the therapeutic diets.

Co-lecturer: Prof. dr. sc. Ivica Harapin, mr. sc. Damjan Gračner

Student is able to interpretate blood tests on the basis of data and conclude which organic system is in failure and target possible diagnoses

Recommended literature:


Examination: oral during semester and written at the end of semester

Manner of supervising the quality and performance of subject: public opinion

COURSE LEADER’S CV
Ljiljana Bedrica, Ph.D.
Clinic for Internal Diseases with Collegium of Cynology, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, 10000 Zagreb, Croatia.

See course G150.

Selected publication:


<table>
<thead>
<tr>
<th>G155.</th>
<th>Ivica Harapin:</th>
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<tr>
<td><strong>DISEASES OF PANCREAS IN DOGS</strong></td>
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</table>

**Duration (in hrs):** 3 lectures, 3 exercises. Credits: 2,5.


Practical Clinical examination and sampling. Practical measuring of enzymes in excrement. Test with glucosa. Preparing the glucose curve. Optimising inzuline dosis.

**Development of general and specific competences (knowledge and skills):** Student is able to interpretate clinical and blood tests on the basis of data and conclude organic system failure, target possible diagnoses and treatment

**Co-lecturer:** Mr. sc. Damjan Gračner

**Recommended literature:**

**Examination:** practical during semester and written at the end of semester

**Manner of supervising the quality and performance of subject:** student's judgement and criticisam after finish course

**Biography:**
Clinic for Internal Diseases with Collegium of Cynology, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, 10000 Zagreb, Croatia. Phone: +385 1 2390-342; Fax: +385 1 2441-390. E-mail: harapin@vef.hr www.vef.hr/~harapin

See course M4.

**Selected publication:**


G156. Darko Gereš:
TUMOURS, NONINFECTION AND NONHEREDITARY CONDITIONS AND MAMMARY GLAND DISEASES OF DOMESTIC CARNIVORS

Duration (in hrs): total 20 (10 lectures, 4 practical and 6 seminars). Credits: 4.5.

Outline:


Development of general and specific competences (knowledge and skills): mammary neoplasms have high incidence in domestic cats and dogs what makes them very important in everyday practice of veterinary surgeons. It is complex and important part of veterinary education and education of students is absolutely necessary in this field.

Co-lecturers: doc.dr.sc. Damir Žubčić, prof.dr.sc. Željko Grabarević, mr. sc. Mario Kreszinger

Recommended literature:

Examination: oral

Manner of supervising the quality and performance of subject: Questionary for students

COURSE LEADER'S CV
Darko Gereš, DVM, ass. prof.
Clinic for Gynecology and Reproduction Ambulatory Clinic, Faculty of Veterinary Medicine, University of Zagreb, Heinzeloova 35, tel: 23 90 324, fax: 23 90 320, e mail. dgeres@vef.hr

He was born in Borovo, on March 11, 1953. He finished Study of Veterinary Medicine, Faculty of Veterinary Medicine, University of Zagreb 1980. Ms.D. in 1991. and PhD in 1996. Working experience: from 1980 to 1989 employed in the Veterinary station, the City of Zagreb. From 1989 he works as the
assistant on the Clinic of Gynecology and Reproduction, and from 2001 as the assistant professor. His promotion to become a professor is in progress. He also gives undergraduate and postgraduate lectures; at the moment he is the mentor of two candidates for master’s and one candidate for a doctor’s degree.

**Selected publications:**


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**G157. Darko Gereš**

**PREVENTION AND SUPPRESSION OF SUBFERTILITY CONDITION OF DIARY COWS**

**Duration (in hrs):** Total 50 (20 lectures, 25 practical, 5 seminars). Credits: 6.0.


Seminars: Fertility types. Monitoring and systematization. Role of veterinarians in the problem area.

**Development of general and specific competences (knowledge and skills):** Subfertility is serious problem in dairy cows and has strategic importance especially keeping in mind soon future import of 150 000 dairy heifers. All together makes additional education of high specialised experts in prevention and treatment of subfertility extremely important.

**Co-lecturers:** doc.dr.sc. Damir Žubčić, mr. sc. Romana Turk

**Recommended literature:**


**Examination:** oral

**Manner of supervising the quality and performance of subject:** Questionary for students

**COURSE LEADER’S**

Darko Gereš, DVM, ass. prof.

Clinic for Gynecology and Reproduction Ambulatory Clinic, Faculty of Veterinary Medicine, University of Zagreb, Heinzelova 55, tel: 23 90 324, fax: 23 90 320, e mail. dgeres@vef.hr
G158. Marijan Cergolj:
UDDER DISEASES

Duration (in hrs): Total 20 (10 hours lectures, 10 hours exercises). Credits: 3.5.

Outline: Lectures: The most recent cognitions in udder physiology. Hormonal regulation of the lactation. Inflammatory and non-inflammatory diseases of the udder and teats and disorders in milk flow.


Development of general and specific competences (knowledge and skills): Mammary gland desease, etiopathogenesis, diagnostic and treatment


Recommended literature:


Examination: Oral exam

Manner of supervising the quality and performance of subject: Questionary for students

COURSE LEADER'S CV
Marijan Cergolj, Ph.D., Professor
Clinic for Obstetric and Reproduction, Faculty of Veterinary Medicine, Heinzelova 55, Zagreb, Croatia, Tel. 01 2390 320, Fax. 01 2390 320, e-mail: marijan.cergolj@vef.hr

Prof. Dr. sc. Marijan Cergolj, was born on April 9, 1947 in Zagreb where he attended primary school, High School. He obtained his diploma from Faculty of Veterinary medicine at Zagreb University in January 1975, and in April started his career in veterinary ambulance “Dvor na Uni” as veterinarian and chief of the Local ambulance in Gornji Javoran. Mr. Cergolj passed his Professional exam in February 1978 and immediately afterwards started working in The Communal Veterinary inspection. Since February 1979, he has been working as an Assistant in Department for Reproduction and Clinic for obstetric. The year after he enrolled a postgraduate study “Physiology and pathology of reproduction with artificial insemination” which he finished in 1984 and obtained Masters Degree. His Doctor’s thesis was obtained in 1989. By the decision of The Republic Committee for Science, Technology and Informatics he was entered into The Official Registry of Researchers in the scientific field Veterinary medicine, identification number 082253. Mr. Cergolj was elected in the science-educational profession as an Assistant Professor in 1991. Under the opinion of the Expert panel and recommendations from the Science-educational board, Senate of veterinary faculty elected him for a teacher in the science-educational profession Associate Professor for subject Obstetric, sterility and artificial insemination, on their July 7, 1998 meeting. Except pedagogic, expert-clinical, science-research work, Mr. Cergolj actively cooperated with colleagues on field, actively participated on numerous expert and science events, counseling, and numerous domestic and international congresses. Prof.dr.sc. Marijan Cergolj is married and father of two children. Fluently speaks Italian and French.

Selected publications:


G159. Marijan Cergolj: PERINATAL DISEASES OF NEWBORNS

Duration (in hrs): Total 20 (10 hours lectures, 10 hours exercises). Credits: 4.0.

Outline: Lectures: Adequate treatment and care of the newborns after delivery and during puerperium. Injuries of the newborns during parturition. Hereditary, organic, and infectious diseases of newborns during a few first days of the puerperium.

Exercises: Comparative applied physiology of the newborns in different species of domestic animals.

Development of general and specific competences (knowledge and skills): Neonatology, intensive care, diseases of newborn animals (etiopathogenesis, diagnostic and treatment)

Associates: Doc. Dr.sc. Tomislav Dobranić, Mr.sc. Marko Samardžija, Nikica Prvanović, dr. vet. med.

Literature for students:

Agreement with Professor

Examination: Oral

Manner of supervising the quality and performance of subject: Questionary for students

COURSE LEADER’S CV
Marijan Cergolj, Ph.D., Professor
Clinic for Obstetric and Reproduction, Faculty of Veterinary Medicine, Heinzelova 55, Zagreb, Croatia, Tel. 01 2390 320, Fax. 01 2390 320, e-mail: marijan.cergolj@vef.hr

See course G158.

Selected publications:


<table>
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<tr>
<th>G160.</th>
<th>Tomislav Dobranić: CLINICAL ASPECTS OF APPLIED ENDOCRINOLOGY REPRODUCTION IN MALE AND FEMALE MAMMALS</th>
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</table>

Duration (in hrs): Total 105 (3 semesters) (30 lectures, 35 seminars, 40 practical). Credits: 6,0.

Outline: Lectures: Recent cognitions from physiology management with sexual cycle, pregnancy and puerperal in domestic female mammals. Results of research hormonal administration in sexual function of male. Current possibility of management in sexual functions of domestic mammals.

Practical: Gynaecological examination of domestic female mammals.


Development of general and specific competences (knowledge and skills): Applied physiology of reproduction, basics of cyclicity and hormonal treatment

Co-lecturers: Zdenko Makek, PhD, professor; Iva Getz, PhD, assistant; Nikica Prvanović, DVM, expert associate, Silvijo Vince, DVM.

Recommended literature:


Driancourt, M. A. (2001): Regulation of ovarian follicular dynamics in farm animals, Implications for manipulation of reproduction, Theriogenology, 55; 1211-1239.

Examination: Oral exam

Manner of supervising the quality and performance of subject: Questionary for students

COURSE LEADER'S CV

G161. Iva Getz:

ASSISTED REPRODUCTIVE TECHNOLOGIES IN DOMESTIC MAMMALS

Duration (in hrs): Total 115 (3 semesters): 20 lectures, 35 seminars, 60 practical. Credits: 8.5.

Outline:

Lectures: Introduction to modern discoveries related to endocrine regulations of reproductive functions and spermatogenesis, physiology and biochemistry of ejaculate in domestic male animals and artificial insemination procedures in different domestic mammals. Collection and assessment of semen, preparation of semen for use in A.I., cryopreservation. Handling and storage of semen, insemination techniques and management of insemination, assessment of optimal timing for A.I.

Practical: collection, handling and assessment of semen, dilution and cryopreservation of semen, collection of embryos (flushing of superovulated donors) and ova (transvaginal ultrasound ovum pick-up), evaluation and classification of embryos and ova, cryopreservation of embryos, embryo transfer in synchronized recipients.


Development of general and specific competences (knowledge and skills): Assisted reproduction in domestic animals, application and approach

Co-lecturers: Dr. sc. Iva Getz, Mr.sc. Martina Karadjole, Mr.sc. Marko Samardžija, Juraj Grizelj, dr.vet.med.

Recommended literature:


Examination: oral

Manner of supervising the quality and performance of subject: Questionary for students

COURSE LEADER'S CV

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<th>G162.</th>
<th>Tomislav Dobranić:</th>
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<td>OBSTETRIC</td>
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Duration (in hrs): Total 150 (3 semesters), (30 lectures, 45 seminars, 75 practical). Credits: 9,0.

Outline: Lectures: Pathology of pregnancy. Physiology and pathology of delivery that is physiology and pathology of puerperium in domestic mammals.

Practical: Assessment and evaluation of dystocia causes.

Seminars: Consideration of embryo and fetus pathology, also mortality of fetus during pregnancy. Cause of abortion, early delivery and organic diseases during pregnancy. Reason and prevalence of delivery disorder as a result of foal and because of mother. Physiological and pathological aspects of puerperal. Endocrinological changes before and after delivery and actors that affect on beginning of delivery in domestic mammals. Abnormalities in behaviour of mothers against newborns and placenta.

Development of general and specific competences (knowledge and skills): Physiology and pathology of parturation, surgical and nonsurgical treatment, etiopathogenesis, diagnostic and prognosis

Co-lecturers: Tomislav Dobranić, PhD, assistant professor; Darko Gereš, PhD, assistant professor; Goran Bačić, PhD, assistant professor; Tugomir Karadjole, MSc, assistant.

Recommended literature:


Examination: Oral exam

Manner of supervising the quality and performance of subject: Questionary for students

COURSE LEADER'S CV

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<th>G163.</th>
<th>Tomislav Dobranić:</th>
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<td></td>
<td>DIAGNOSTIC AND TREATMENT OF INFERTILITY IN DOMESTIC MAMMALS</td>
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Duration (in hrs): Total 144 (3 quartals) (24 lectures, 40 seminars, 80 exercises). Credits: 10,0.

Practical: Rectal, gynecology and ultrasound examinations of cows during puerperium.

Seminars: Types of impotencia in domestic males, their causes and outcomes. Exogenes and endogenes disturbances during genital reflexes in male mammals.

Development of general and specific competences (knowledge and skills): Basics of infertility in domestic mammals, etiopathogenesys, diagnostic and treatment

Co-lecturers: Prof. Dr.sc. Zdenko Makek, Doc. dr. sc. Darko Gereš, Mr. Sc. Marko Samardžija

Recommended literature:


Examination: oral

Manner of supervising the quality and performance of subject: Questionary for students

COURSE LEADER’S CV

Tomislav Dobrančić, Ph.D., assistant professor
Clinic for Obstetrics and Reproduction, Faculty of Veterinary medicine, Heinzelova 55, Zagreb, Croatia,
Phone: 01 2390 157, fax, 01 2390 320, e-mail: dobranic@vef.hr

He was born in Zagreb, on 21th February 1962. He finished primary school «Sela» in place Sela near Sisak and secondary school in Petrinja, course expert in upbringing-education process, in 1980. He started on Faculty of Veterinary medicine in academic year 1980/81. After entry he went serving of army. He finished Faculty of Veterinary medicine in November 1986. Working experience: Veterinarian at Veterinary ambulance Sisak, from 01. December 1988. He passed expert exam in Marth 1988. Expert asisstant at Faculty of Veterinary medicine, Clinic for obstetrics and reproduction from 01. July 1988. He registered postgraduate study from «Phisiology and pathology of reproduction with artificial insemination» in 1989., and finished it in 1993., when defended successfully masters degree «The surveillance, fertility and milk production in cows and heifers after caesarean operation». In the year 1997., he became an asisstant on Clinic for obstetrics and reproduction on Faculty of Veterinary medicine and 07. of July he defended successfully a dissertation «Impact od cadmium salts aplicated peroral on genitaly organs and pregnancy in rabbit». Under decision of Ministry of science and tehnology he entered in scientific register. On proposal by Clinic for obstetrics and reporproduction, under public contest he was became a senior asisstant in 17. Marth 1998. He actively participate in three projects which finance by Ministry of science and tehnology and actively participate in every forms of education on Clinic for obstetrics and reproduction, also on postgraduate classes from Theriogenology and expert study from pathology of domestic carnivore. He was choosen in scientifnic – education rank asisstant profesor on Clinic for obstetrics and reproduction 5th of December, 2001. Heretofore he announced 47 works in domestic and foreign journals. He activly speak German language and he has wife and two kids.
Selected publications:

G164. | Goran Bačić: GYNECOLOGICAL SURGERY

Duration in hours: Total 50, 15 lectures, 5 seminars and 30 laboratory practice. Credits: 6.0.

Outline: Lectures: General surgical procedures and materials, Anaestesiology in obstetrics, Obstetrical surgical procedures (Cesarean section, Contusions and lacerations of birth canal), Gynecological surgical procedures (Perineal, vulval, vaginal and cervical surgery, Uterine and ovarial surgery, Udder surgery, Introduction to reproduction organs minimal invasive surgery).
Seminars: Case base study based on cases from practice – students presentations.
Laboratory practice: Students participation in practical preoperational procedures, induction anaestesiology and surgical procedures.

Development of general and specific competences (knowledge and skills): Basics and specificity of gynecological surgery

Co-lecturer: Tugomir Karadjole MSc DVM

Recommended literature:
Lynetta J. Freeman: Veterinary endosurgery (1999), Mosby.
John C. Thurmon et all: Lumb & Jones Veterinary anaesthesia (1996), Williams & Wilkins.
Examinations: written and oral exam at the end of course completion

Manner of supervising the quality and performance of subject: Questionary for students

COURSE LEADER CV

Goran Bačić, DVM, MS, PhD Assistant Professor
Reproduction and Obstetrics Clinic / Ambulatory Clinic, Veterinary College, Zagreb University, Heinzelova 55, Zagreb, Croatia, phone: 385 1 2390 322, fax: 385 1 2390 320, e-mail: bacic@vef.hr


Selected publications:


G165. Zdravko Janicki, Duro Huber: WILDLIFE HANDLING PROCEDURE

Number of hours: Total 90 (15 hours of lectures, 45 hours of practice, 30 hours of seminar). Credits: 6,0.

Content: Lectures: Commonly used terminology and definition of wild animals, wildlife, game and protected specious; Basics on hunting legislative; Game and wildlife in parks and households; Most common reasons for wildlife handling; Types of handling procedures; Basics of game handling and transportation; Game and wildlife restraint and capturing methods; Handling in nature environmental; Handling and immobilizing equipment; Chemical immobilisation; Immobilisation protocol and treatment; Transportation protocol of game and wildlife, cage and vehicle; Transportation pre-medication of game and wildlife; Welfare of game and wildlife in transport and handling; Wildlife and game marking (ear tagging, collars etc); Wildlife radio tagging

Practices: Game restraint and immobilisation in fenced area; Adopting and preparing equipment for restraint, immobilisation, Chap-cure guns, nets, traps; Use of prepared equipment; Equipment and drugs for chemical pre-treatment and immobilisation of wildlife; Physiological complications caused by chemical immobilisation; Prevention of complications; Transport pre-medication of game and wildlife; Marking equipment; Handling protocols and transportation; Transportation: vehicle, timing, distance, monitoring; Radio tagging equipment introduction and use; Orientation and GPS position determination; Procedure
Development of general and specific competences (knowledge and skills): Through the subject “Wildlife handling procedure” attendants will acquire special skills and knowledge from the field of professional handling procedures necessary in the intensive game and wildlife breeding/management techniques. Except professional through the subject will be encourage bioethical approach based on up to date welfare knowledge of farmed game. Particular themes are planned as seminar subjects in order to improve student’s professional approach based on the previously accepted skills during undergraduate study. In practical part of course attendants will challenge the most demanding professional skills of the wildlife handling and chemical immobilisation. Aim of the program is to shape specialists trained in planning and performing technology and activities of intensive breeding and management as well as translocation of wildlife with especial emphasis on avoiding professional gaps and diminishing all risks in procedure. Program will qualify attendants in tasks of consulting, planning and projecting game handling facilities.

Associates: Josip Kusak PhD, DVM; Dean Konjević, DVM; Tomislav Gomerčić DVM; Krešimir Severin, DVM

Literature:
Nielsen, L. (1999) Chemical immobilization of wild and exotic animals

Exam: Independent seminar work, colloquium, written and oral exam.

Manner of supervising the quality and performance of subject: According to University Statute (student’s opinion poll, etc.)

COURSE LEADER’S CV

Prof Zdravko Janicki PhD, DVM
School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia

Selected publications:
Tišljar, Marina; Janić, Damir; Grabarević, Željko; Šimpraga, Borka; Marinculić, Albert; Pinter, Lijljana; Janicki, Zdravko; Nemanić, Ankica.Stress-induced Cushing's syndrome in fur-chewing chinchillas. // Acta Veterinaria Hungarica. 50 (2002) , 2; 133-142 (ćlanak, znanstveni rad).
Konjević, Dean; Janicki, Zdravko.Bolesti divljaci, zoonoze i mogući načini provedbe profilaktičnih mjera. // Šumarski list. 126 (2004) , 3-4; 3-6 (ćlanak, strucni rad).
Konjević, Dean; Janicki, Zdravko; Slavica, Alen; Lazar, Peter. Transport jelenske divljači s posebnim osvrtom na moguće probleme. // Stočarstvo. 57 (2003), 2; 145-151 (članak, strucni rad).

Konjević, Dean; Slavica, Alen; Janicki, Zdravko. Kemijjska imobilizacija divljači. // Veterinarska stanica. 33 (2003), 2; 95-103 (članak, strucni rad).

Konjević, Dean; Slavica, Alen; Janicki, Zdravko. Potreba za zdravstvenim nadzorom u uvjetima čestog premještanja divljači u lovištima RH. // Veterinarska stanica. 33 (2003), 5; 299-300 (članak, strucni rad).

Gjurčević Kantura, Vesna; Kolić, Eduard; Zobundžija, Mladen; Mihelić, Damir; Janicki, Zdravko; Slavica, Alen. Some histofunctional observations in the diaphragm of fallow deer (Dama dama) from the National park Brijuni (Croatia) // Some histofunctional observations in the diaphragm of fallow deer (Dama Dama) from the National park Brijuni (Croatia) / Congress Secretariat (ur.). Brno : University of Veterinary and Pharmaceutical Sciences Brno, 2002. 93 (sažetak, znanstveni rad).


Janicki, Zdravko; Konjević, Dean; Slavica, Alen; Severin, Krešimir. Reversible Chemical Immobilization of Free-Ranging Red Deer (Cervus elaphus L.) using Different Drugs // Veterinarski arhiv – u tisku

Prof. dr. sc. Đuro Huber
Biology Department, Veterinary faculty, Heinzelova 55, 10000 Zagreb, Hrvatska
See course M9.

Selected publications:

G166. Zdravko Janicki, Albert Marinculić:
INVASIVE DISEASES OF GAME AND WILDLIFE

Number of hours: Total 90 (15 hours of lectures, 45 hours of practice, 30 hours of seminar). Credits: 8.0.

Description and contents of subject: Lectures: Epidemiology, zoonoses, invasive diseases; Risk factors of disease appearance; Contacts of domestic and wild animals, cohabitation of game and domestic animals (migrations, nomadic type of livestock breeding); Protozoan diseases (Coccidiosis, Piroplasms, Sarcocystis, Toxoplasmosis, Histomoniasis); Diseases caused by helminths; Diseases caused by arthropods; Parasitological diagnostic in wild animals; Basic monitoring with prevention and therapy of invasive diseases in game and wild animals

Practices: Organization and establishment of parasitological laboratory; Processing and preparing of diagnostic materials; Marking and evidentiat interpretation of diagnostic materials; Parasitological maps; Identification of Protozoans, Helminths and Arthropods; Coprological test and eggs identification; Influence of invasion intension on general health condition; Serological and molecular diagnostic methods; Interpretation of monitoring results; Collecting and sampling of feces; Recognizing the epidemiological situation in game breeding facilities (natural and intensive breeding); Coprological monitoring on field (how to collect material on right places before and after shooting); Therapy treatment based on carried out monitoring; Group therapy; How to mix antiparastics in game food; Individual therapy; Carry out methods
for disease suppression in game farms and menageries; Disinfection and rodent control during game farming.

Seminars: Ecology and biological diversity of parasites; Risks of parasitic diseases appearance; Legislature - introducing statutory regulations which regulating suppressing and prevention of parasitic diseases; Organization of proper monitoring in game farms, menageries and hunting grounds; Referential data basis for specific districts; Specifics in parasitic therapy and treatment of game and wild animals; Molecular diagnostic methods for invasive diseases.

**Development of general and specific competences (knowledge and skills):** This subject stimulates comparative approach to research of wildlife and game parasitology. Attendants will gain special skills and knowledge related to diagnostic procedures in wildlife and game invasive diseases, which mean recognising the most often type of parasites, basic knowledge of their pathophisiology manifestation and choosing the most efficiency therapy (drug type and way of application). Also, knowledge of proper prevention for parasitic diseases will be put on higher level. The goal of the subject is to form experts that are capable for conduction of health monitoring in wildlife and game management, with special concerns for prevention of spreading parasitic diseases from wildlife to livestock and humans, as same as parasitic zoonoses. Attendants will acquire special skills that are necessary to control health status of endangered species.

**Associates:** Alen Slavica, PhD, DVM; Dean Konjević, DVM; Krešimir Severin, DVM

**Literature:**


**Exam:** Independent seminar work, colloquium, written and oral exam.

**Manner of supervising the quality and performance of subject:** According to University Statute (student’s opinion poll, etc.)

**COURSE LEADER’S CV**

**Prof Zdravko Janicki PhD, DVM**

School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia

See course G165.

**Selected publications:**


Albert Marincuči, Ph.D. Professor
Department of Parasitology and Parasitic Diseases, Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia, phone 01 2390 362, fax 01 2390 362, e-mail: albert@vef.hr
See course G133.

Selected publications:

G167. Zdravko Janicki, Željko Grabarević, Emil Srbočan:
COMPARATIVE PATHOLOGY AND ECOTOXICOLOGY OF WILDLIFE

Number of hours: Total 90 (15 hours of lectures, 45 hours of practice, 45 hours of seminar). Credits: 9.5.
Content: Lectures: Wildlife necropsy procedure; Field necropsy – possibilities, legislative, safety measures, protection from zoonoses with special emphasis on diseases related to natural foci, Field necropsy kit; Overview of amphibian and reptile pathology; Overview of pathology in free-living birds; Overview of pathology in free-ranging mammals; ZOO pathology; Degenerative changes; Neoplastic diseases; Clinical pathology and interpretation of acquired results; Sampling and shipment of materials for additional analysis; Recognition of post-mortal alterations; Carcass utilization – traditional and modern approach, legislative; Essentials of ecotoxicology; Sources of poisoning; Bioindicators of environmental contamination with poisons; Application of poisons in the ecosystem; Secondary poisonings and its significance
Practices: Amphibian necropsy protocol; Reptile necropsy protocol; Necropsy protocol for feathered game and birds in either laboratory or field conditions with obligate photo documentation; Necropsy of furry game and wild mammals in field conditions with obligate photo documentation; Sampling in the field conditions; Fixation and shipment of materials for microbiological analysis; Sampling, fixation and shipment of materials for toxicological analysis; Trimming and preparation of samples for histological examination; Making histological diagnosis; Procedure with carcasses prior to and after the field necropsy; Estimation of time of death and forensic investigation in wildlife; Comparison of gross and microscopic lesions caused by viral diseases in different game and wildlife species; Comparison of gross and microscopic lesions caused by bacterial diseases in different game and wildlife species; Risk from poisoning in respective game and wildlife categories; Monitoring of pesticide impact on game and wildlife.

Seminars: Based on the results of necropsy examination, histopathological and additional analysis, attendants are obligated to collect necessary literature and to reconstruct the case, from cause through development to outcome of the disease. The complete reconstruction of the case will be presented on seminars by PowerPoint. Other topics (botulism, organophosphorous and carbamate pesticides, anticoagulant rodenticides, PBC, dioxins, lead, mercury, poisonous plants, naphtha, phthalates) – attendants are obligated to choose one topic, to elaborate it and present it with PowerPoint.

**Development of general and specific competences (knowledge and skills):** This subject stimulates comparative approach to research of wildlife and game pathology as well as developing of the critical evaluation of causes for such conditions and possibilities how to overcome them. Attendants will gain special skills and knowledge related to diagnostic procedures in wildlife diseases, wildlife necropsy protocol, drug selection and methods of drug administration. The goal of the subject is to form experts that are capable for conduction of health monitoring in wildlife and subsequently to prevent spreading of diseases from wildlife to livestock and humans. Attendants will acquire special skills that are necessary to control health status of endangered species.

**Associates:** Alen Slavica, PhD, DVM; Dean Konjević, DVM; Krešimir Severin, DVM

**Literature:**


**Exam:** Independent seminar work, colloquium, written and oral exam.

**Manner of supervising the quality and performance of subject:** According to University Statute (student’s opinion poll, etc.)

**COURSE LEADER’S CV**

Prof Zdravko Janicki PhD, DVM

School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia
See course G165.

Selected publications:

Kierdorf, Uwe; Konjević, Dean(2004); Janicki, Zdravko; Slavica, Alen; Keros, Tomislav; Čurlik, Jan. Tusk abnormalities in wild boar (Sus scrofa L.). // European Journal of Wildlife Research. 50; 48-52 (članak, znanstveni rad).

Konjević, Dean; Gudan, Andrea; Grabarević, Željko; Janicki, Zdravko; Petrinec, Zdravko; Artuković, Branka(2004). The pathohistological presentation of spontaneous pyelonephritis in fat dormice (Glis glis L.)-case report. // European Journal of Wildlife Research. 50, 2; 92-94 (članak, znanstveni rad).

Šimec, Zoran; Grabarević, Željko; Artuković, Branka; Janicki, Zdravko; Seiwerth, Sven; Krušlin, Božo; Matijatko, Vesna. (2001) Ovarian hemangioma in the wild boar (Sus scrofa). A case report. // Zeitschrift für Jagdwissenschaft. 47; 268-274 (članak, znanstveni rad).

Prof Emil Srebočan, Ph.D., DVM
Department of pharmacology and toxicology of the Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia

See course G85.

Selected publications:


Željko Grabarević, Ph.D. Professor of Pathology
Department of general pathology and pathological morphology of the Veterinary Faculty University of Zagreb, Heinzelova 55, Zagreb, Croatia, Phone +385 1 2390313, e-mail: zgrabar@vef.hr

See course G165.

Selected publications:


G168. Zdravko Janicki, Zoran Milas:
INFECTIOUS DISEASES OF WILDLIFE

Number of hours: Total 90 (15 hours of lectures, 45 hours of practice, 30 hours of seminar). Credits: 8.0.

Content: Lectures: Epidemiology of wildlife diseases; Epidemiology - zoonoses; Risk factors and outbreaks; Risk calculation; Domestic animals and wildlife interfaces (game migration, keeping of livestock at pastures; nomadic type of livestock breeding); Game as reservoirs and vectors of infectious diseases; Natural foci; Viral diseases; Bacterial diseases; Infections with anaerobic microorganisms; Diseases caused by prions – CWD, TSE of minks; Legislative
Practices: Sampling methodology; Hygiene and sanitation procedures in hunting grounds and breeding places; Sampling and shipment of material for analysis; serological tests; immune-based tests (allergic and serologic)

Seminars: Prophylactic measures of infectious diseases in wildlife; Oral vaccination: rabies, classical swine fever; Models of treatment of bacterial diseases in wildlife; Prophylactic hunt; Game as a depot of infectious diseases; Zoonoses

Development of general and specific competences (knowledge and skills): Through the subject “Infectious Diseases of Wildlife” attendants will acquire special skills and knowledge from the field of epidemiology, diagnostic and therapeutic procedures of infectious diseases of wildlife. Thusly they will be qualified for the tasks derived from the field of health protection in wildlife with special emphasis on zoonoses and other diseases that are related to domestic and wild animals. Certain units of this subject are approached highly specialist, assuming that attendants have already gained basic knowledge on the diseases of domestic animals.

Literature:
Peter J. Hudson: The ecology of wildlife diseases Oxford University Press, 2000, New York

Exam: Independent seminar work, colloquium, written and oral exam.

Manner of supervising the quality and performance of subject: According to University Statute (student’s opinion poll, etc.)

COURSE LEADER’S CV
Prof Zdravko Janicki PhD, DVM
School of Veterinary Medicine, University of Zagreb, Heinzelova 55, HR-10000 Zagreb, Croatia
See course G165.

Selected publications:
Konjević, Dean; Gudan, Andrea; Grabarević, Željko; Janicki, Zdravko; Petrinec, Zdravko; Artuković, Branka. (2004) The pathological presentation of spontaneous pyelonephritis in fat dormice (Glis glis Li.) - a case report. // European Journal of Wildlife Research. 50; 92-94 (članak, znanstveni rad).
Tišljar, Marina; Janić, Damir; Grabarević, Željko; Šimpraga, Borka; Marinčulić, Albert; Pinter, Ljiljana; Janicki, Zdravko; Nemanić, Ankica. (2002) Stress-induced Cushing’s syndrome in fur-chewing chinchillas. // Acta Veterinaria Hungarica. 50, 2; 133-142 (članak, znanstveni rad).
Konjević, Dean; Janicki, Zdravko. (2004) Bolesti divljaca, zoonoze i mogući načini provedbe profilaktičnih mjera. // Šumarski list. 126, 3-4; 3-6 (članak, stručni rad).
Zdravko, Janicki; Jadranka, Foršek; Alen, Slavica; Eduard, Kolić; Danko, Deždek; Luka, Manojlović. Hematološke vrijednosti jelenih lopatara (Dama dama L.) otočne i kontinentalne populacije Republike Hrvatske // Zbornik radova - Drugi hrvatski veterinarski kongres s međunarodnim sudjelovanjem / Tomislav Balenović (ur.).
Željko, Župančić; Kovač, Snježana; Draženović; Vukić, Berislav; Milas, Zoran; Janicki, Zdravko; Starošić, Vilim. A serological survey of hemagglutination – inhibition antibodies to human type A and B Influenza viruses in wild pigs in Croatia // Vet, Med.-Czech. 45, 347-351.

Assoc Prof Zoran Milas, PhD, DVM
Department of Microbiology and Infectious Diseases with Clinic, Faculty of Veterinary Medicine University of Zagreb, Heinzelova 55, Zagreb, Croatia phone: +385 1 2390 200, fax: +385 1 2390 211, e-mail: zmilas@vef.hr.
See course G129.

Selected publications:


G169. Željko Mikulec: OPTIMALIZATION OF RATION AND FEED MIXTURES FOR ANIMALS

Duration (in hrs): Total 30 (8 lectures, 17 practical, and 5 seminars). Credits: 3,5.

Outline: Lectures: Basic chemical composition of feedstuffs. Using of feedstuffs and feed additives in rations and feed mixtures. Working with percentages and units in animal nutrition. Predicting feed intake and factors that affect feed intake. Principles of calculating rations for ruminants. Basic principles of calculating feed mixtures. Bioenergetics (NEI, NEm, NEg i TDN). Basics of using specialized software for calculating ration or feed mixture.


Seminars: Discussion and calculations based on interest of students

Development of general and specific competencies (knowledge and skills): Student must be capable to recognize situations when it is necessary to take feed samples for chemical analysis, how to manage samples and how to interpret the results. On the basis of this information student must be capable of calculating feed mixtures and rations by hand and computer and to recognize possible deficiencies which could influence the health of an animal.

Recommended literature:


Examination: Written examination.
Manner of supervising the quality and performance of subject: Anonymous student's questionnaire.

COURSE LEADER'S CV
Željko Mikulec, Ph.D., Associate Professor
Department of Animal Nutrition, Faculty of Veterinary Medicine, HeinzeloVa 55, 10 000 Zagreb, Phone: 01/2390273, fax: 01/2441390, e-mail: zmikulec@vef.hr

He was born in 1966. in Zagreb, where he completed his education. He finished his study on the Faculty of Veterinary Medicine, University of Zagreb in 1991. He gained his Ms degree in 1994. and PhD in 1996. In period from 1991. to 1993. he has been employed as a nutritionist in feed mill Poljoprerada, Zagreb. In 1993. he was working as assistant, in 2000. as assistant professor, and in 2004. as associate professor on course Physiology and Pathology of Animal Nutrition in Department of Animal Nutrition. He lectures on Polytechnic of Karlovac on course Feed Production and Game Nutrition. In 1997. he worked as a guest researcher on Department of Animal Science on Massey University (Palmerston North, New Zealand), and in 1998. in Bayerische Landesanstalt für Tierzucht, (Grub-München, Germany). He is member of World’s Poultry Science Association (WPSA).

Selected publications:

G170. Željko Mikulec: SPECIFICATIONS OF SMALL RUMINANT NUTRITION

Duration (in hrs): Total 30 (15 lectures and 15 seminars). Credits: 4.0.


Seminars: New developments in small ruminant nutrition.

Development of general and specific competencies (knowledge and skills): By acquiring new information in this elective course the students will expand their knowledge in the field of sheep and goat nutrition, and increase their competence in field work in this growing branch of animal production in our
country. After completing the course the students will be able to point out potential nutritive deficiencies in feed and feeding regime and give advice how to correct the existing and formulate new rations.

Recommended literature:


Examination: Seminar written essay and oral examination.

Manner of supervising the quality and performance of subject: Anonymous student's questionnaire.

COURSE LEADER'S CV
Željko Mikulec, Ph.D., Associate Professor
Department of Animal Nutrition, Faculty of Veterinary Medicine, Heinzelova 55, 10 000 Zagreb, Phone: 01/2390273, fax. 01/2441390, e-mail: zmikulec@vef.hr

See course G169.

Selected publications:

Duration (in hrs): Total 10 (5 lectures and 5 seminars). Credits: 3.0.


Development of general and specific competencies (knowledge and skills): During the course of the studies students will acquire basic understanding of the development of veterinary profession through the history, increasing their general educational and cultural informedness.

Associates: Prof. dr. sc. Stela Fatović (HAZ), primarius dr. Vladimir Dugački (liječnik u mirovini), prof. dr. sc. Ante Škrobonja (Medicinski fakultet Sveučilišta u Rijeci)

Recommended literature:

Examination: Written and oral examination.

Manner of supervising the quality and performance of subject: Student's questionnaire.

ŽIVOTOPIS VODITELJICE PREDMETA
Prof. dr. sc. Vesna Vučevac Bajt
Zavod za društvene znanosti u veterinarstvu, Katedra za povijest, Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb, Heinzelova 55, tel. 01 2390 131, fax: 01 2441 390, e-mail: baji@vef.hr

Vesna Vučevac-Bajt was born on 10th March, 1948, in Vinkovci, where she attended primary and secondary school. She graduated on 14th October, 1972 from the Veterinary Faculty, University of Zagreb. As a student, she wrote five scientific papers, four of which were awarded the first Rector’s award, and one a first Krka award. In 1973, she was appointed assistant at the Chair of History of Veterinary Medicine, at the Veterinarian faculty,University of Zagreb (today the Chair makes a constituent part of the Department of Humanities). In 1976, she won her Ph.D. degree. She was appointed an assistant professor in 1986, and the associate professor in 1990. She was appointed a tenured full professor in 2003. Vesna Vučevac-Bajt is the head of the Chair for History of Veterinary Medicine and the person in charge of the Museum for the History of Veterinary Medicine in Croatia, which has its premises at the Veterinary Faculty of Zagreb. She teaches courses History of Veterinary Medicine and Introduction to Veterinary Medicine. She published some 150 papers, booklets and brochures. She also wrote a manual for the students of veterinary medicine titled “History of Veterinary Medicine” (1993), working materials “Introduction to the History of Veterinary Medicine” (1974), and “Introduction to Veterinary Medicine” (1999), which are used as handbooks for internal use. She has participated at a number of national and international conferences. Vesna Vučevac-Bajt was a head of two scientific projects and has participated in two other projects. Since 2000, she has been the head of the scientific project sponsored by the Ministry of Science and Technology.
titled “Veterinary Medicine in Croatia from the Medieval times to the Present Days” (0053065). She has been the secretary of the Section for the history of veterinary medicine of the Republic of Croatia, which is a part of the Croatian Veterinary Chamber, a member of World association for the history of veterinary medicine, and Scientific Society for the History of Health Culture of the Republic of Croatia. In 1996, she participated in devising a project “Science in Croatia”, sponsored by the Ministry of Culture of the Republic of Croatia, where she was in charge of the terminology used in veterinary medicine from the pre-historic to the present times. She has been a member of the publishing comitee of “Acta Medico-Historica Adriatica”, an international magazine in the field of history of veterinary medicine. For more than ten years she has actively collaborated with the Lexicographic Institute “Miroslav Krleža”. She was an associate in devising Croatian lexicon I (1996) and Croatian lexicon II (1997). She is one of the authors of the Veterinary terminology alphabet of the Croatian encycopedia, and the head of the working team for the history of veterinary medicine, as well as the author of around 60 terms so far published. In 2001/2, she was a member of the Comitee for the Evaluation of Zagreb Veterinary Faculty, that was carried out by the EAEVE expert team. She is the author of the introductory text of the published report. Last promotion in Full Professor, Permanent Tenure: 18.07.2003.

Selected publications:


Vesna Vučevac Bajt: Veterinarska povijest Hrvatske kao znanstveni projekt gospodarske povijesti. Časopis za suvremenu povijest. God. 33., br. 3., 841-852.


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<td>PROTECTION MECHANISMS OF MAMMALS CENTRAL NERVOUS SYSTEM</td>
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**Duration (in hrs):** Total 15 (10 lectures and 5 exercise). Credits: 3.5.

**Outline:** blood-brain barrier; anatomy of blood-brain barrier; cross a substances throughout blod-brain barrier; cerebrospinal fluid; anatomy of cerebrospinal fluid system; general hypothesis of secretion, circulation and absorption of cerebrospinal fluid; new hypothesis of formation and absorption of cerebrospinal fluid

Exercise: anaesthesia of cat; collection of cerebrospinal fluid and blood samples in cat; measurement of osmolality and determination of neurotransmitters metabolites in obtained samples; observed results interpretation
Recommended literature:


Examination: written and oral

COURSE LEADER'S CV

Darko Orešković
Laboratory of neurochemistry and molecular neurobiology, Department of molecular biology; Ruder Bošković Institute, Bijenička cesta 54, Zagreb, tel: 385 1 4680 218; e-mail: doresk@rudjer.irb.hr


Selected publications:


Orešković D, Whitton PS, Perišić D, Marković Z, Bulat M. Brain gamma-aminobutyric acid and protection from picrotoxin-induced convulsions following treatment with di-n-propylacetamide and di-n-propylacetic acid. Period Biol 89: 17-20, 1987


Orešković D, Klarica M, Vukić M. Does the secretion and circulation of the cerebrospinal fluid really exist?. Medical Hypotheses 56 (5). 622-624, 2001
