**SYLLABUS**

**GRADUATE PROFESSIONAL STUDY PROGRAMME**

***SUSTAINABLE AND ORGANIC AGRICULTURE***

**BASIC DATA**

1. **Teachers and associates administering the classes according to the study programme:** are listed for each individual subject in individual teaching plans
2. **Administration of direct teaching according to schedule:** minimum 50% of the teaching plan of individual subjects listed below.
3. **Place where the classes are administered:** lecture rooms of Križevci University of Applied Sciences, field trips are administered outside Križevci University of Applied Sciences
4. **Beginnings and end; timetable of classes:** classes are administered according to timetable published on the University website ([www.vguk.hr](http://www.vguk.hr))
5. **Teaching forms:** listed for each individual subject at the beginning of the teaching plan
6. **Exam:** listed for each individual subject at the beginning of the teaching plan.
7. **Exam terms:** exam terms are determined according to calendar of teaching activity during the academic year published at the University website ([www.vguk.hr](http://www.vguk.hr))
8. **List of literature for studying and preparing for exam:** listed for each individual subject at the beginning of the teaching plan.
9. **Administration of classes in a foreign language:** study programme is administered in the Croatian language and individual subjects in the foreign language as listed in teaching plans for individual subjects.

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| **Code:****Annex 5/SOUK/A 4.3.1.** |

 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: obligatory** | **Sustainable development in agriculture** | **ECTS credits 6** |
| **Code:** 192631 |  | Semester: I |
| Teachers and associates: | **Zvjezdana Augustinović, Ph. D., college professor** **Sandra Kantar, Ph. D., college professor****Silvije Jerčinović, Ph. D., college professor** |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Define the concept of sustainable development. To train students to think independently and critically about the possibilities of sustainable development in agriculture in order to be able to predict which of the planned interventions in agricultural production will, in the long run, cause the least damage to the environment, be economically profitable, socially just and ethically acceptable.

**SUBJECT DESCRIPTION**: The aim of the subject is to define the concept of sustainable development and train students to think independently and critically about the possibilities of sustainable development in agriculture in order to be able to predict which of planned operations in agricultural production, in the long run, cause the least damage to environment, be economically profitable, socially just and ethically acceptable. The Subject program Sustainable development in agriculture through lectures, exercises and seminars enables students to understand the concept of sustainable development and the concept of sustainability from a sociological, economic and agronomic aspect. Through the Subject, students will understand the characteristics, position and importance of sustainable agriculture in relation to other systems in agriculture.

**Learning outcomes**

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| ***LEARNING OUTCOMES******After completing the exam from the subject „Agricultural ecology and environmental economics“ the student will be able to:*** |
| 1. Define the concept of sustainability from the sociological, economic and agronomic aspects  |
| 2. Explain the concept of sustainable development and its wide application in society.  |
| 3. To single out examples of quality management of sustainable development  |
| 4. Develop greater competence in interpreting the social aspect of sustainable development.  |
| 5. Adopt the principles of sustainable development and contribute to the creation of a society based on sustainability.  |
| 6. Assess the interrelationship between economic development and sustainability.  |
| 7. To give an example of good practice of social and economic well-being in the local environment from the aspect of sustainable development.  |
| 8. Create a socially responsible business proposal based on the example of a small or medium-sized enterprise.  |
| 9. Analyze the state and trends in the exploitation of basic resources: energy, water and arable land  |
| 10. To establish the causes and threats of environmental pollution with sources from agriculture  |
| 11. Distinguish renewable from non-renewable energy sources and identify the possibilities of using renewable energy sources in agricultural production  |
| 12. Explain the ways and directions in agricultural production and evaluate their contribution to increasing sustainability  |
| 13. Describe the characteristics, position and importance of sustainable agriculture in relation to other systems in agriculture  |
| 14. Argue the importance of sustainable agriculture in the preservation of habitats, biological diversity and its contribution to the multifunctionality of agriculture |

**Literature:**

*Obligatory:*

1. Bačun, D., Matešić, M. Omazić, M.A. (2012): Leksikon održivog razvoja, Zagreb: Hrvatski poslovni savjet za održivi razvoj, dostupno na: <http://www.dop.hr>
2. Cifrić, I. (2002): Okoliš i održivi razvoj. Zagreb: HSD i Zavod za sociologiju.
3. Črnjar, M., Črnjar, K. (2009): Menadžment održivoga razvoja: ekonomija, ekologija, zaštita okoliša, Fakultet za menadžment u turizmu i ugostiteljstvu u Opatiji, Glosa, Rijeka.
4. Daly, H. E. (2007): Ecological Economics and Sustainable Development, Selected Essays of Herman Daly, Edward Elgar Publishing Limited, Cheltenham
5. Dresdener, S. (2008): The Principles of Sustainability, Earthscan, London
6. Herceg, N. (2013): Okoliš i održivi razvoj, Synopsis d.o.o., Zagreb
7. Kisić, I. (2014): Uvod u ekološku poljoprivredu, Agronomski fakultet Sveučilišta u Zagrebu, Zagreb
8. Lay, Vladimir i Šimleša, Dražen (2012): Nacionalni interesi razvoja Hrvatske kroz prizmu koncepta održivog razvoja. Zagreb: Institut društvenih znanosti Ivo Pilar.
9. Pravilnik o integriranoj proizvodnji poljoprivrednih proizvoda, (2010) „Narodne novine“, 132, Zagreb.
10. Pravilnik o integriranoj proizvodnji poljoprivrednih proizvoda (2012): „Narodne novine“, 137, Zagreb.
11. Pravilnik o izmjenama i dopunama Pravilnika o integriranoj proizvodnji poljoprivrednih proizvoda (2014) “Narodne novine“ 59, Zagreb.
12. Šimleša, D. (2010): Ekološki otisak: Kako je razvoj zgazio održivost. Zagreb: Tim Press i IDZ Ivo Pilar.
13. Znaor, D. (1996): Ekološka poljoprivreda, Globus, Zagreb

*Supplementary:*

1. Belz, F., Peattie, K. (2010): Sustainability Marketing, John Wiley & Sons, Ltd.
2. Blewitt, J. (2017): Razumijevanje održivog razvoja. Zagreb: Naklada Jesenski i Turk.
3. Cifrić, I. (1989): Socijalna ekologija. Zagreb: Globus.
4. Cifrić, I. (2003): Ruralni razvoj i modernizacija (pogl. II i III). Zagreb: IDIS.
5. Cifrić, I. (1994): Napredak i opstanak. Zagreb: HSD i Zavod za sociologiju Filozofskog fakulteta.
6. Gold, M. (2007): Sustainable Agriculture: Definitions and Terms. In: Sustainable agriculture –Terminology. I. Special Reference Briefs Series no. SRB 99-02., Dostpuno na: <http://www.nal.usda.gov/afsic/pubs/terms/printPHP2.php>
7. Geiger Zeman, M., Zeman, Z. (2010): Uvod u sociologiju (održivih) zajednica. Zagreb: IDZ Ivo Pilar.
8. Lay, V. (2002): “Prilozi osmišljavanju usmjeravanja razvitka ruralnih prostora Hrvatske na osnovama ekološke i gospodarske održivosti“. U: M. Štambuk, I. Rogić, A. Mišetić ur. Prostor iza, kako modernizacija mijenja hrvatsko selo. Zagreb: IDZ Ivo Pilar.
9. Lay, V. (2007): „Vizija održivog razvoja Hrvatske“. U: Lay, V. (ur.). Razvoj sposoban za budućnost. Zagreb: Ivo Pilar.
10. Lay, V., Kufrin, K., Puđak, J. (2007). Kap preko ruba čaše. Zagreb: Hrvatski centar "Znanje za okoliš"
11. Lokalna agenda 21 u Hrvatskoj: izazovi održivog razvoja u lokalnim zajednicama, Zagreb: Regionalni centar zaštite okoliša za Srednju i Istočnu Europu, dostupno na: <http://croatia.rec.org/wp-content/uploads/2012/01/LA21KChrv2.pdf>
12. Malthus, T. R. (1798): An Essay on the Principle of Population, J. Johnson, in St. Paul’s Church-Yard, London
13. Martin, D., Schouten, J.(2011): Sustainable Marketing, Prentice Hall, 1 edition
14. Meadows, D. H., Randers, J., Meadows, D.L. (2004), Limits to Growth, Chelesa Green Publishing, White River Junction
15. Održivi razvitak Hrvatske. (2003): Društvena istraživanja, 12 (3-4; 65-66).
16. Simons, I. G. (2010): Globalna povijest okoliša. Zagreb: Disput.
17. Strategija održivog razvoja Hrvatske. Dostupno na: <https://narodne-novine.nn.hr/clanci/sluzbeni/2009_03_30_658.html>
18. United Nations (1992): Agenda 21: The Rio Declaration on Environment and Development. New York: United Nations.
19. World Commission on Environment and Development (WCED) (1987): Our Common Furure (The Brundtland report). New York: Oxford University Press Inc.

Subject holder:

Zvjezdana Augustinović, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: obligatory**  | **Information technologies in agriculture** | **ECTS credits: 6** |
| **Code:** 192636 |  | Semester I |
| Teachers and associates: | **Krunoslav Škrlec, Ph. D., college professor****Siniša Srečec, Ph. D., college professor****Dejan Marenčić, Ph. D., college professor** |
|  | Lessons |  |
| Lectures | 30 |
| Exercises + seminars  | 30 |
| Practical training | 0 |  |

**SUBJECT OBJECTIVE:**

Introduce the students with contemporary information technology. Explain the notion of IT system and its usage within the problem solving process, its construction and adaptation to specific field of interest. Emphasize all advantages of such systems and point to disadvantages emerging from inadequate use of such systems.

**SUBJECT DESCRIPTION:** To acquaint students with modern information technology and its application in agriculture. Explain what an information system is and how to use it in solving problems, how to build it and adapt it to the area of interest. Emphasize all the advantages provided by such a system, but also point out the disadvantages arising from the irresponsible use of such systems. To introduce students to the application of experimental plans to select and perform simple statistical analyzes and correctly interpret the obtained results.

**Learning** outcomes

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| ***LEARNING OUTCOMES******After completing the exam from the subject „Information technologies in agriculture“ the student will be able to:*** |
| 1. Define the information system  |
| 2. Apply the information system as a business system model  |
| 3. Explain the procedures for building an information system related to the area of interest  |
| 4. Categorize the components of the information system in relation to the input parameters of the observed problem  |
| 5. Design a decision support information system in relation to the problem being solved  |
| 6. Calculate and determine, using statistical methods, the strength and intensity of the interaction between several independent and dependent variables  |
| 7. Explain the estimated parameters of experimental plans  |
| 8. Explain the set hypotheses, draw conclusions and interpret the obtained results |

**Literature:**

*Obligatory:*

1. Čerić, V., Varga, M. I Birolla, H.: “Poslovno računarstvo”, Znak, Zagreb, 1998.
2. Srića, V., Spremić, M.: „Informacijskom tehnologijom do poslovnog uspjeha“, Sinergija, Zagreb, 2000.
3. Kapš, M., Lamberson, W.R. (2004): Biostatistics for animal science. CABI Publishing, CAB International, Wallingford, UK.
4. Horvat, D., Ivezić, M. (2005.): Biometrika u poljoprivredi. Grafika, Osijek.
5. Gogala, Z. (2001.): Osnove statistike. Nakladništvo Sinergija d.o.o.

*Supplementary:*

1. Srića, V., Muller, J.: „Put k elektroničkom poslovanju“, Sinergija, Zagreb, 2001.
2. Panian, Ž.: „Izazovi elektroničkog poslovanja“, Narodne novine d.d., Zagreb, 2002.
3. Šošić, I. (2004.): Primijenjena statistika. Školska knjiga, Zagreb.

Subject holder:

Krunoslav Škrlec, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Predmet: obligatory**  | **Soil protection** | **ECTS credits: 6** |
| **Code:** 141707 |  | Semester II |
| Teachers and associates: | **Andrija Špoljar, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

The aim of the subject is to learn about the sources of pollutants, their movement and retention in the environment and their entry into the food chain with harmful consequences for animal and human health. With the aim of sustainable soil management, students will also learn about soil damage classification and soil remediation methods. Students will also get acquainted with methods of conservation tillage, as one of the essential elements of conservation agriculture.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Soil protection“ the student will be able to:*** |
| 1. Define basic terms from soil protection (pollution, pollutant, heavy metals, etc.)  |
| 2. To connect the fundamental principles of sustainable soil management (soil protection)  |
| 3. Interpret climatic elements and data from the calculation of components of the rainfall water balance in the soil  |
| 4. Valuing the soil according to the Ordinance on particularly valuable and valuable agricultural land  |
| 5. Calculate the amount of necessary fertilizers for the needs of soil recultivation  |
| 6. Use modern computer technologies in creating tables and graphs and writing text  |
| 7. Recommend soil rehabilitation measures with the aim of improving agricultural production  |
| 8. Present the results of your own work (public presentation) |

**Literature:**

*Obligatory:*

1. Šimunić, I., Špoljar, A., Peremin Volf Tomislava (2007): Vježbe iz tloznanstva i popravka tla, skripta, Visoko gospodarsko učilište u Križevcima, Križevci.
2. Špoljar, A., Čoga, L., Tušek, T. (2011): Onečišćenje okoliša. Visoko gospodarsko učilište u Križevcima, udžbenik, 132 str.
3. Jug, D. (2018): Obrada tla. Skripta,Poljoprivredni fakultet U Osijeku, Osijek, 47 str.

*Supplementary:*

1. Bašić, F., Herceg, N. (2010): Temelji uzgoja bilja. Sveučilište u Mostaru, Mostar, 454. str.
2. Jug., I. (2016): Štetne tvari u tlu. Predavanje iz modula Osnove agroekologije, Poljoprivredni fakultet u Osijeku, 10 str.
3. Kisić, I., Bašić, F., Butorac, A., Mesić, M., Nestroy, O., Sabolić, M. (2005): Erozija tla vodom pri različitim načinima obrade. Udžbenici Sveučilišta u Zagrebu, Zagreb.
4. Kisić, I. (2012): Sanacija onečišćenoga tla. Sveučilište u Zagrebu, udžbenik, 276. str.
5. Kisić, I. (2016): Antropogena erozija tla. Udžbenik Sveučilišta u Zagrebu, Zagreb, 274 str.
6. Špoljar, A. (2016): Procesi degradacije tla. Odabrano predavanje iz predmeta Konzervacijska poljoprivreda, Visoko gospodarsko učilište u Križevcima, Križevci, 29 str.

Subject holder:

Andrija Špoljar, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| **Predmet: obligatory** | **Mechanisation systems in sustainable and organic agriculture** | **ECTS credits: 6** |
| **Code:** 141708 |  | Semester I |
| Teachers and associates: | **Miomir Stojnović, M. Sc., senior lecturer** **Vlado Kušec, M. Sc., senior lecturer** |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Introduce the students with the role and specificities of application of mechanisation in sustainable and organic agriculture, introduce them with the construction and principle of work of machines and equipment in plant production and livestock breeding, teach them to plan procurement and usage of required machines and equipment in line with demands of sustainable and organic agriculture and in line with the farm's size and structure taking into consideration valid regulations related to environment protection and disposal of agricultural byproducts and waste in ecologically acceptable way.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Mechanisation systems in sustainable and organic agriculture“ the student will be able to:*** |
| 1. Distinguish the importance and specifics of mechanization in sustainable and ecological agriculture in relation to conventional production  |
| 2. Show the principle of operation and construction of machines and devices necessary for sustainable and ecological agricultural production  |
| 3. Rationally and purposefully plan equipment, machines and devices for sustainable and ecological agricultural production  |
| 4. Calculate the productivity of machines used in sustainable and ecological agriculture  |
| 5. Describe environmentally acceptable procedures for disposal of organic waste and by-products of agricultural origin  |
| 6. Differentiate risk factors in the application of mechanization in the disposal of organic waste and by-products of agricultural origin  |
| 7. Summarize the key factors for the efficient and rational application of mechanization in the disposal of organic waste and by-products of agricultural origin  |
| 8. Prepare a presentation on the application of mechanization in the disposal of organic waste and by-products of agricultural origin |

**Literature:**

*Obligatory:*

1. Brčić J. (1991): Mehanizacija u biljnoj proizvodnji, Zagreb
2. Brčić J. (1991): Mehanizacija u povrćarstvu, Zagreb.
3. Brčić J. (1997): Mehanizacija u voćarstvu i vinogradarstvu, Zagreb
4. Senčić Đ., Antunović Z., Mijić P., Baban M., Puškadija Z. (2011): Ekološka zootehnika, Poljoprivredni fakultet u Osijeku, Osijek
5. Zimmer R., Košutić S., Zimmer D. (2010): Mehanizacija u ratarstvu, Osijek

 6. Kušec V., Sito S. (2014): Uređaji i oprema za navodnjavanje, Križevci

 7. Kušec V., Sito S. (2019): Strojevi i oruđa za kultiviranje i obradu tla, Križevci

*Supplementary:*

1. Aktualni zadaci mehanizacije poljoprivrede, Zbornici radova
2. dlg-test. De, Das Net – Magazin Fur Landtechnik

Subject holder:

Miomir Stojnović, M. Sc., senior lecturer

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| **Predmet: obligatory** | **MARKET AND MARKETING OF PRODUCTS IN SUSTAINABLE AND ORGANIC AGRICULTURE** | **ECTS credits: 6** |
| **Code:** 241451 |  | Semester III |
| Teachers and associates: | **Kristina Svržnjak, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 30 |
| Exercises + seminars  | 30 |

**SUBJECT OBJECTIVE:**

Introduce the students with theory of market and marketing of products from sustainable and organic agriculture. Enable the participants for market research, problem analysis, marketing preparation of organic products.

**Learning outcomes**

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| ***LEARNING OUTCOMES******After completing the exam from the subject „*Trade and marketing of products in sustainable and organic agriculture*“ the student will be able to:*** |
| 1. 1. Explain the basic terms in the field of market and marketing in agriculture
 |
| 1. 2. Explain the basic elements of the ecological products market and eco marketing
 |
| 1. 3. Explain the basic elements of marketing mix and promotion mix for the purpose of better market position of ecological products
 |
| 1. 4. List the policies of socially responsible companies
 |
| 1. 5. Conduct a survey on social responsibility on the agricultural farm and analyze the obtained research results
 |
| 1. 6. Use e-portals for the sale of agricultural products in Croatia
 |
| 1. 7. Make a SWOT analysis
 |
| 1. 8. Find projects related to the market or marketing of ecological products in the EU on the page of the European Network for Rural Development
 |
| 1. 9. Propose a project related to the market or marketing of ecological products in Croatia based on EU projects
 |
| 1. 10. Give an idea and create a slogan, advertising poster for a specific product
 |
| 1. 11. Use the database of protected products in the EU
 |
| 1. 12. Present your own research results
 |

**Literature:**

*Obligatory:*

1. Kolega, A., Božić M.: Hrvatsko poljodjelsko tržište, Zagreb, 2001.
2. *Kotler, P.:Upravljanje Marketingom, Analiza, Planiranje, Primjena i Kontrola (9. izdanje), Mate, Zagreb,* 2001.
3. Leko-Šimić, M.: Marketing hrane, Sveučilište J. J. Strosmayera Osijek, 2002.
4. Leon G. Schiffmanm, L. L. Kanuk: Ponašanje potrošača, Mate, 2004.
5. Previšić, J., Ozretić-Došen, Đ.: Marketing, Adverta, 2004.
6. Ružić, D.: e- Marketing, Ekonomski fakultet Osijek, Osijek, 2003.

*Supplementary:*

1. Armstrong, G., Kotler, P., Marketing: An Introduction, Prentice Hall, 7th ed., 2004.
2. Cova, B., Ghaur P., Salle, R., **Projektni marketing,** Algoritam. Zagreb, 2011.
3. Kohls R., Uhl N. J.: Marketing of agricultural products. Purdue University, New Jersey, 1998.
4. Previšić, J., Bratko, S.: *Marketing*, Zagreb, 2001.

Subject holder:

Kristina Svržnjak, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: obligatory** | **Ecologically acceptable methods of plant protection** | **ECTS credits: 6** |
| **Code:** 63 |  | Semester II |
| Teachers and associates: | **Marijana Ivanek-Martinčić, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Introduce the students with the selection of ecologically acceptable methods of plant protection and types of ecologically acceptable substances for plant protection. Introduce the students the students with the scale for measuring ecological acceptability of substances. enable the students to select adequate ecologically acceptable measures for protecting agricultural crops from harmful organisms within the scope of integrated or organic agricultural production.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Ecologically acceptable methods of plant protection“ the student will be able to:*** |
| 1. Present the principles of ecologically acceptable plant protection and criteria of ecological acceptability  |
| 2. Describe environmentally acceptable methods of plant protection  |
| 3. Describe environmentally acceptable plant protection products  |
| 4. Describe the criteria for evaluating the ecological and toxicological properties of plant protection products  |
| 5. Explain the principles and procedures of integrated plant protection  |
| 6. Explain the principles and procedures of plant protection in organic production  |
| 7. Present legal regulations related to the protection of plants in organic production  |
| 8. Propose ecologically acceptable measures to protect individual crops from more important harmful organisms in integrated or organic production  |
| 9. Analyze the success of applied protection methods on the agricultural farm and propose the necessary improvements |

**Literature:**

*Obligatory:*

1. Igrc Barčić, J., Maceljski, M. (2001) Ekološki prihvatljiva zaštita bilja od štetnika, Zrinski Čakovec,.
2. Božena Barić, Ivana Pajač Živković (2020): Načela integrirane zaštite bilja, Sveučilište u Zagrebu, Agronomski fakultet

*Supplementary:*

1. Neil Helyer, Nigel D. Cattlin, Kevin C. Brown (2014) Biological control in Plant Protection, CRC Press
2. Fortmann M. (2000) Das grosse kosmobuch der Nutzlinge, Neue wege der biologischen Schadlingsbekampfung, Franckh-Kosmos,
3. Malais, M. H., Ravensberg, W. J. Ravensberg (2003) Knowing and recognizing, The biology of glasshouse pests and their natural enemies, Koppert B. V.
4. Glasilo biljne zaštite br. 5, 2014. – tema broja: Integrirana zaštita <https://hrcak.srce.hr/broj/13638>
5. **Pravilnik o kontrolnom sustavu ekološke poljoprivrede (NN 11/2020 (29.1.2020.)**
6. Zakon o poljoprivredi (NN: 118/18, važi od 1. siječnja 2019.)
7. Zakon o dopunama Zakona o poljoprivredi (NN 042/2020)
8. Zakon o izmjenama i dopunama Zakona o poljoprivredi (NN 052/2021)
9. **UREDBA (EU) 2018/848 EUROPSKOG PARLAMENTA I VIJEĆA od 30. svibnja 2018. o ekološkoj proizvodnji i označivanju ekoloških proizvoda te stavljanju izvan snage Uredbe Vijeća (EZ) br. 834/2007**

*Useful links:*

<http://www.iobc-wprs.org/>

[www.**ifoam**.org](http://www.ifoam.org)

<http://www.koppert.com/Home.13133.0.html?&L=1>

<http://www.biobest.be/>

[www.organicgrains.ncsu.edu/production/product](http://www.organicgrains.ncsu.edu/production/product)

[www.cefs.ncsu.edu/.../guides/organicproduction](http://www.cefs.ncsu.edu/.../guides/organicproduction)

[www.nysipm.cornell.edu/organic\_guide](http://www.nysipm.cornell.edu/organic_guide)

Subject holder:

Marijana Ivanek-Martinčić, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: obligatory**  | **Selected chapters in animal nutrition** | **ECTS credits: 6** |
| **Code:** 141711 |  | Semester II |
| Teachers and associates: | **Dejan Marenčić, Ph. D.,** **college professor** |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Enable the students to use adequate and balanced nutrition in order to achieve successful production of livestock products in ecologically acceptable and sustainable way.

**Learning outcomes**

|  |
| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Selected chapters in animal nutrition“ the student will be able to:*** |
| 1. Classify nutrients and list their most important representatives  |
| 2. Explain the procedure for putting together an ecologically sustainable meal  |
| 3. Enumerate nutritional errors and anti-nutritional substances and describe their impact on production, animal health and environmental pollution  |
| 4. Organize canning and storage of feed on the farm without the use of additives  |
| 5. To compose a meal-fodder mixture that meets the needs of domestic animals in organic farming, without harmful effects on the health of people and animals and with as little environmental pollution as possible. |

**Literature:**

*Obligatory:*

1. Pintić V., Marenčić D., Pintić Pukec Nataša (2016): Hranidba domaćih životinja – odabrana poglavlja, Udžbenik, Visoko gospodarsko učilište u Križevcima.
2. Pintić V., (2004): Hranidba domaćih životinja – Poglavlje: *Poznavanje krmiva*. Skripta, III dopunjeno i recenzirano izdanje, Visoko gospodarsko učilište u Križevcima.
3. Senčić Đ., Antunović Z., (2003): Ekološko stočarstvo. Poljoprivredni fakultet u Osijeku. Osijek
4. Uremović Z., i sur. (2008): Ekološko stočarstvo. Agronomski fakultet u Zagrebu. Zagreb
5. Schumacher U., (2002): Milchviehfütterung im ökologischen Landbau. Praxis des ökolandbaus, 1. Auflage, Bioland Verglas GmbH, Mainz

*Supplementary:*

1. Kirchgessner M., (2011): Tierernährung, 13., neu überarbeitete Afulage von Roth, Schwarz und Stangel DLG Frankfurt (Main).
2. Kirchgessner M., Friesecke H.: (1996): Wirkstoffe in der pratischen Tierernhrung. Mnchen, Basel, Wien.

Subject holder:

Dejan Marenčić, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: elective** | **production OF CROPS IN sustainable and organic agriculture** | **ECTS credits: 6** |
| **Code:** 141712 |  | Semester II |
| Teachers and associates: | **Vesna Samobor, Ph. D., college professor****Zvjezdana Augustinović, Ph. D., college professor** |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Familiarize and train students for plant production in systems of sustainable (integrated) and ecological production of field crops on their own farms, in professional institutions and companies such as: seed companies, producers and processors of field crops, stores of seed and planting materials.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES*****After completing the exam from the subject „Arable crops production in sustainable and organic agriculture“** |
| 1. Explain the production rules applicable in sustainable and/or ecological production of field crops  |
| 2. Explain the importance of changing different agricultural crops in the crop rotation  |
| 3. Assess the possibility of growing certain agricultural crops in ecological production related to the agro-climatic conditions of the area  |
| 4. Organize the cultivation of selected agricultural crops according to the principles of sustainable and/or ecological production  |
| 5. Analyze applied agrotechnical measures on a certain farm and, if necessary, propose improvements  |
| 6. Select and recommend cultivars that correspond to agroecological conditions with the aim of reducing the effect of various biotic and abiotic stresses and making recommendations for production and business.  |
| 7. Propose appropriate care measures for crops from a specific family from sowing to harvesting, taking into account the strict production conditions.  |
| 8. Propose agricultural techniques for the production of a certain crop, related to yield and quality |

**Literature:**

*Obligatory:*

1. Lampkin, N. ( 1990.): Organic farming. Ipswich, UK,Farming Press
2. Lampkin, N., Foster, C., Padel, S.˛& Midmore, P. (1999.): The policy and regulatory environment for organic farming in Europe. Organic farming in Europe: economics and policy Vol. 1, Stuttgart, university of Hohenheim1.
3. Scialabba Nadia El-Hage and Hattam Caroline (2002): Organic agriculture, environment and food security
4. ENOF White book: 1999. Organic farming research in the EU towards 21st century ( Ed. J. Isart & J.J. Lerena, Barcelona.)
5. Znaor, D. (1996.): Ekološka poljoprivreda, Globus Zagreb

*Supplementary:*

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| --- |
| 1. Jošt, M., Samobor, Vesna. [Oplemenjivanje pšenice za organsku proizvodnju](http://bib.irb.hr/prikazi-rad?&rad=482817) // *Agronomski glasnik*. 70 (2008) , 6; 543**-**561 (članak, znanstveni).
 |
| 1. Matotan, Zdravko; Samobor, Vesna; Erhatić, Renata. [Zaštita biološke raznolikosti kultivranih vrsta povrća u Hrvatskoj](http://bib.irb.hr/prikazi-rad?&rad=482539). / *Agronomski glasnik*. 70 (2009) , 6; 527-542 (članak, znanstveni).
2. Samobor Vesna, Ž. Vukobratović, Dragica Nađ, Irena Turk and M. Jošt. [Komparacija uroda i parametara kakvoće između konvencionalne i ekološke proizvodnje pšenice](http://bib.irb.hr/prikazi-rad?&rad=483003) //Proceedings of the 5th International Congress Flour-Bread 09 / Žaneta Ugarčić- Hardi (ur.).
 |

 Subject holder:

Vesna Samobor, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| **Subject: elective** | **Sustainable and organic cattle production of meat and milk** | **ECTS credits: 6** |
| **Code:** 141713 |  | Semester II |
| Teachers and associates: | **Dražen Čuklić, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

The students will acquire basic knowledge about sustainable and organic cattle production of milk and meat and apply it independently in agricultural production.

**SUBJECT DESCRIPTION:** within the subject Sustainable and ecological cattle production of meat and milk, students will learn about the principles of ecological production of meat and milk. They will get to know the legal regulations in production and the possibilities of application in the Republic of Croatia.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Sustainable and organic cattle production of meat and milk“ the student will be able to:*** |
| 1. Describe the different breeds of cattle
 |
| 1. Assess the suitability of cattle breeds for ecological cattle production of milk and/or meat
 |
| 1. Propose standards in ecological cattle production of milk and/or meat
 |
| 1. Point out problems in ecological cattle production of milk and/or meat
 |
| 1. Organize efficient ecological cattle meat production
 |
| 1. Assess adequate breeding methods in production
 |
| 1. Highlight the skills of a successful agricultural entrepreneur in real situation
 |

**Literature:**

1. Ivanković, A., Mijić, Pero (2020): Govedarstvo, Agronomski fakultet, Zagreb
2. Uremović, Z.(2008): Ekološko stočarstvo, Agronomski fakultet, Zagreb
3. Asaj., A. (2006): Ekološko stočarstvo i homeopatija. Medicinska naklada, Zagreb.
4. Caput., P. i sur. (2010): Očuvanje biološke raznolikosti u stočarstvu. Hrvatska mljekarska udruga, Zagreb.
5. Senčić., Đ. Antunović., Z. (2003): Ekološko stočarstvo. Katava, Osijek.

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Subject holder:

Dražen Čuklić, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| **Subject: elective** | **SUSTAINABLE SYSTEMS OF VEGETABLE PRODUCTION** | **ECTS credits: 6** |
| **Code:** 215009 |  | Semester II |
| Teachers and associates: | **Tomislava Peremin Volf, M. Sc., senior lecturer** |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Introduce the students with basic principles of vegetable production in systems of integrated and organic production.

**SUBJECT DESCRIPTION:** The aim of the subject Sustainable vegetable production systems is to acquaint students with the basic principles of growing vegetables in sustainable production systems. Through the Subject, students will be introduced to the basic features of integrated and ecological vegetable production, legal regulations, prerequisites for the development of vegetable production (market, climate, soil, water, fertilizer, workforce), variety selection, growing seedlings, and the importance of crop rotation and soil fertility maintenance , as well as acceptable protection measures in integrated and ecological production. By creating a seminar, students actively participate in classes through topics related to the technology of production of selected vegetable species from the Alliaceae, Brassicaceae, Solanaceae, Cucurbitaceae, Asteraceae, Apiaceae, Fabaceae, Asteraceae and Chenopodiaceae families. Through field classes, students will learn about the organization and production technologies of vegetable crops on family farms.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Integrated and organic vegetable production“ the student will be able to:*** |
| 1. interpret production rules applicable in sustainable vegetable production systems  |
| 2. List the most important morphological and biological properties of vegetable crops and growing conditions  |
| 3. Choose a variety or hybrid for a specific purpose, area and terms of cultivation  |
| 4. To propose the cultivation technology of the selected vegetable crop according to the principles of sustainable production (integrated and/or ecological production)  |
| 5. to analyze the success of the applied technology of growing vegetable crops on the selected farm |

**Literature:**

*Obligatory:*

1. Igrc Barčić, J. i Maceljski, M.: Ekološki prihvatljiva zaštita bilja od štetnika. Zrinski d. d., Čakovec, 2001.
2. Lešić Ružica i sur. (2004): Povrćarstvo. Zrinski d. d., Čakovec.
3. Maceljski, M. i sur.: Štetočinje povrća, Zrinski d.d., Čakovec, 2004
4. Matotan, Z.(2004): Suvremena proizvodnja povrća, Nakladni zavod Globus, Zagreb.
5. Pavlek Paula i sur.(1985): Opće povrćarstvo, Sveučilište u Zagrebu.
6. Znaor D. (1996): Ekološka poljoprivreda. Nakladni zavod „Globus“ Zagreb.
7. Zakoni i propisi koji reguliraju integriranu i ekološku proizvodnju
8. Tehnološke upute za integriranu proizvodnju povrća za 2014. godinu, Ministarstvo poljoprivrede, ribarstva i ruralnog razvoja

*Supplementary:*

1. Rubatzky, V., Yamaguchi, E.(1996): World vegetables, Champam&Hall, New York.
2. Znanstveni i stručni članci

Subject holder:

 Tomislava Peremin Volf, M. Sc., senior lecturer

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: elective** | **Animal physiology and toxicology – selected chapters** | **ECTS credits: 6** |
| **Code:** 70 |  | Semester II |
| Teachers and associates: | **Tatjana Tušek, Ph. D., college professor** **Marijana Ivanek-Martinčić, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Enable the student to differentiate reactive functioning of mammals and poultry in stressful conditions of conventional production and housing (light, pollution, noise, metabolic stress due to forced production properties) (exposure to harmful influence of toxic plants, biotoxins and various toxic substances). By means of timely recognition of the right sample, the student will be able to assess the situation and undertake timely preventative action in order to preserve the livestock.

**SUBJECT DESCRIPTION:** Selected chapters from animal physiology and toxicology is an elective subject for students of the graduate study programme in Agriculture, studying Sustainable and Organic Agriculture. The subject covers specificities in the physiology of the digestive system of domestic mammals and poultry; excellent specificities in the physiology of the reproductive system of domestic mammals and poultry and special cell physiology. Selected chapters from toxicology cover the division of poisons according to strength and mode of action on the organism. The purpose of the subject is to prepare the student to distinguish the life processes and reactions of animals to their environment.

**Learning outcomes**

|  |
| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Animal physiology and toxicology – selected chapters“ the student will be able to:*** |
| 1. The student will distinguish the life processes and reactions of animals to their environment.  |
| 2. Assess the physiological status of animals in conditions of undesirable environmental influences (poisoning, undesirable influence of noise and light).  |
| 3. Categorize poisons by origin and degree of toxicity.  |
| 4. Decide what preventive measures can be implemented to prevent undesirable consequences of stress.  |
| 5. Interpret the application of the PCR technique in determining gene mutations caused by environmental influences |

# Literature:

*Obligatory:*

1. Asaj, Antun (2003): Higijena na farmi i u okolišu. Medicinska Naklada, Zagreb.
2. Babić, K., Melita Herak, Tatjana Tušek (2003):U: Anatomija i fiziologija domaćih životinja. Visoko gospodarsko učilište Križevci i Zrinski d. d. Čakovec.
3. Forenbacher, S. (1998): Otrovne biljke i biljna otrovanja životinja.
4. Špoljar, A., Tatjana Tušek, L.Čoga (2011): Onečišćenje okoliša. Visoko gospodarsko učilište u Križevcima i Alfa d. d. Zagreb.
5. Tušek, Tatjana (2 000.): Fiziologija stoke (praktikum). Visoko gospodarsko učilište Križevci, Križevci, 1-45.
6. Urednici hrvatskog izdanja: S. Milinković-Tur, M. Šimpraga (2017): Fiziologija domaćih životinja. Sveučilišni udžbenik. Naklada Slap, Jastrebarsko.

*Supplementary:*

1. Grupa autora (2012): Veterinarski priručnik. Medicinska naklada, Zagreb.
2. Randall, D. W. Burggren, Kathleen French, R. Fernald (1997): Eckart Animal Physiology. Mechanisms and Adaptations. (Fourth edition). W. H. Freeman and Company, New-York.
3. Toplak Galle, K. (2001): Hrvatsko ljekovito bilje. Mozaik knjiga, Zagreb.
4. WEB stranice.

Subject holder:

Tatjana Tušek, Ph. D., college professor

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| **Subject: elective** | **SUSTAINABLE and organic production of fruits and vine grapes** | **ECTS credtis: 6** |
| **Code:** 192638 |  | Semester II |
| Teachers and associates: | **Branka Svitlica, Ph. D., college professor****Dragutin Kamenjak, grad. ing., senior lecturer** |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Enable the students to plant new plantations of fruit or grape vine according to principles of integrated and organic agricultural production.

**SUBJECT DESCRIPTION:** The subject programme allows participants to acquire the necessary knowledge about the organization of sustainable grape and fruit production, taking into account their agroecological requirements, morphological properties and physiological laws of growth, development and fertility, applying appropriate ampelotechnical/auxiliary and agrotechnical measures. The participants will be familiar with the definition of sustainable cultivation and trends in the world and in Croatia, as well as legal regulations and prerequisites for organizing such production. The participants will get to know the appropriate technological procedures in such production: cultivation systems, operations of cut in the ripe and green cut, soil maintenance systems and fertilization. In the chapter on protection against pests, the symptoms of the most important damages will be covered, as well as the biology of their causative agents and methods of protection in accordance with permitted measures and means. The assortment will also be considered, with special emphasis on varieties resistant to fungal diseases (interspecies hybrids). At the field lesson, the participants will learn about the specifics of such cultivation at the sample farms.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Integrated and organic production of fruits and vine grapes“ the student will be able to:*** |
| 1. Explain the principles and legislation of sustainable ways of growing fruit, grapes and wine.
 |
| 1. Describe the most important morphological characteristics of vines and fruit trees.
 |
| 1. Evaluate production areas and agro-ecological conditions for growing fruit and vines according to the principles of sustainable cultivation.
 |
| 1. Select varieties/clones, substrates and cultivation systems of vines and fruit species suitable for sustainable cultivation.
 |
| 5. Explain ampelotechnical, auxiliary and agrotechnical measures suitable for the principles of sustainable grape and fruit cultivation.  |
| 6. Organize the existing production of selected fruit species or grapes and wine according to the principles of sustainable cultivation.  |
| 7. Recognize damage and pests of vines and fruit trees.  |
| 8. Maintain the threshold of harm by using combined methods of protection in accordance with the regulations of sustainable cultivation.  |
| 9. Implement protection in the production of fruit and grapes according to the principles of sustainable production, in accordance with the prevailing climatic conditions and legal regulations.  |
| 10. Critically evaluate the production on a sample integrated/ecological farm and suggest improvements if necessary |

**Literature:**

*Obligatory:*

1. Ciglar, I. (1988): Integrirana zaštita voćnjaka i vinograda, Zrinski d.d., Čakovec
2. Maceljski, Milan (2006): Štetočinje vinove loze, Zrinski d.d., Čakovec
3. Mirošević, N., Jasminka Karoglan Kontić (2008): Vinogradarstvo, Globus, Zagreb
4. Svitlica, B., Kamenjak,D. (2021): Održivi sustavi proizvodnje voća I grožđa, interni materijali (prezentacije) s održanih predavanja i vježbi na predmetu, VGUK
5. Zakoni i propisi koji reguliraju održivu proizvodnju voća, grožđa i vina (Narodne novine)

*Supplementary:*

1. Hofman, U., Köpfer, P., Werner. A (1995): Ökologischer Weinbau, Ulmer, Stuttgart
2. Igrc Barčić, J., Maceljski, M (2001): Ekološki prihvatljiva zaštita bilja od štetnika
3. Karlsson, B., Karlsson, p. (2014.): Biodynamic, Organic and Natural Winemaking: Sustainable Viticulture and Viniculture, Floris Books, USA
4. Lind, K., Lafer, G., Schloffer, K. Innerhofer, G., Meister, H. (2003): Organic Fruit Growing, CABI Publishing
5. MK Patil / MD Kamble (2016): Organic fruits growing, Agrotech Press
6. Rombough, Lon (2002): Grape Grower: A Guide to Organic Viticulture, Chelsea Green
7. Jamie Goode and Sam Harrop (2011): Authentic wine, toward natural and sustainable winemaking, University of California Press, Ltd.
8. Jean-Michel Florin (2021): Biodynamic wine growing, Floris Books
9. Raymond P. Poincelot (2004): Sustainable Horticulture: Today & Tomorrow, Prentice Hall
10. Waldin, M. (2016): Biodynamic Wine, Infinite Ideas L.T.D.
11. Znanstveni i stručni članci iz područja održive proizvodnje voća, grožđa i vina

Subject holder:

Branka Svitlica, Ph. D., college professor

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| **Subject: obligatory** | **PRODUCTION AND APPLICATION OF FERTILIZERS IN SUSTAINABLE AND ORGANIC AGRICULTURE** | **ECTS credits: 6** |
| **Code:** 154314 |  | Semester: I |
| Teachers and associates: | **Ivka Kvaternjak, Ph. D., college professor** |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Enable the students to adequately select and use fertilizers in organic and sustainable agriculture according to soil fertility and cultivation system with adequate agrotechnical measures.

**SUBJECT DESCRIPTION**: The first part of the subject deals with soil fertility and plant nutrition from the aspect of ecological and sustainable agricultural production. The emphasis is on the use of fertilizers in ecological production, composting processes, compost quality and fertilization with organic fertilizers, the use of which is allowed in ecological agriculture. Differences between conventional, sustainable and ecological fertilization and good agricultural practice of using fertilizers are also discussed. As part of the exercises, compost analyzes are performed, the results are interpreted, and the quantities of compost and other organic fertilizers required for fertilization on the organic farm are calculated.

**Learning outcomes**

|  |
| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Production and application of fertilizers in sustainable and organic agriculture“ the student will be able to:*** |
| 1. Single out the soil according to its fertility  |
| 2. Point out errors in soil fertilization  |
| 3. Differentiate between ecological, sustainable and conventional fertilization  |
| 4. Correctly choose materials for composting  |
| 5. Describe the types of fertilizers with regard to their origin and purpose  |
| 6. Organize the implementation of compost analyses  |
| 7. Interpret the results of compost analyses  |
| 8. Assess the appropriate use of organic fertilizers and compost as a source of nutrients for crops. |

**Literature:**

*Obligatory:*

|  |  |
| --- | --- |
| 1. | Epstein, E. (1997): The Science of Composting. Technomic, Basel. (knjiga) |
| 2. | Diaz, L.F., De Bertoldi, M., Bidlingmaier, W., Stentiford, E. (2007): Compost science and technology. Waste mangement series 8. p. 381 |
| 3. | Lončarić, Z. (2005): Analize organskih gnojiva i supstrata. Poljoprivredni fakultet u Osijeku. (interna skripta)  |
| 4. | Kisić, I. (2014) Uvod u ekološku poljoprivredu. Agronomski fakultet u Zagrebu |
| 5. | Vukadinović, V., Vukadinović, V. (2011): Ishrana bilja. Poljoprivredni fakultet u Osijeku. (udžbenik) |

*Supplementary:*

|  |  |
| --- | --- |
| 1. | Lončarić, Z., Karalić, K. (2015): Mineralna gnojiva i gnojidba ratarskih usjeva. Poljoprivredni fakultet Sveučilište u Osijeku. |
| 2. | Magdoff, F.R., Tabatabai, M.A., Hanlon, E.A. (1996): Soil Organic Matter: Analysis and Interpretation. SSSA Special Publication Number 46. SSSA. Madison, Wisconsin, USA. (knjiga)  |
| 3. | Benčević. K. (1993): Biokont. Osnove biološkog poljodjelstva. Poslovna zajednica za stočarstvo. Zagreb. (knjiga)  |
| 45. | Znaor, D. (1996): Ekološka poljoprivreda. Nakladni zavod Globus. Zagreb.(knjiga)  Keith Baldwin, R and Greenfield Jackie, T. (2009): Composting on Organic Farms.1-21.  |
| 6. | ISO standardi, HR standardi, zakoni i pravilnici, znanstveni i stručni radovi fertilizacije u ekološkoj poljoprivredi (radovi) Subject holder:Ivka Kvaternjak, Ph. D., college professor |

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: obligatory** | **Zootechnique**  | **ECTS credits: 6** |
| **Code:** 154312 |  | Semester: I |
| Teachers and associates: | **Tatjana Jelen, Ph. D., college professor****Dejan Marenčić, Ph. D., college professor** **Marijana Vrbančić Igrić, mag. ing. agr., senior lecturer**  |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Enable the students to independently organise organic livestock production and administer all technological processes in sustainable and organic livestock production of monogastric and polygastric domestic animals and poultry.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Zootechnique” the student will be able to:*** |
| 1. Distinguish breeds (genotypes) of domestic animals for ecological breeding, the most important properties and use  |
| 2. Select the best way of breeding protected breeds with the application of valid measures and regulations  |
| 3. Give an example of an appropriate way of implementing selection and reproduction  |
| 4. Extract and apply valid legal provisions in ecological animal husbandry  |
| 5. Explain measures of animal welfare in ecological livestock farming (in breeding and exploitation)  |
| 6. Recognize the limiting factors and critical points in ecological breeding of different species and categories of livestock according to recommendations and standards  |
| 7. Give an example of the positive impact of organic farming on the quality of livestock food products  |
| 8. Classify nutrients and list their most important representatives  |
| 9. Evaluate types of fodder and feed supplements according to their nutritional value for individual types of livestock  |
| 10. Identify possible health disorders due to improper use of feed |

**Literature:**

*Obligatory:*

1. Caput P., A. Ivanković, B. Mioč (2010): Očuvanje biološke raznolikosti u stočarstvu, Udžbenik, Hrvatska mljekarska udruga.
2. Posavi M., Ernoić M., Ozimec R., Poljak F. (2002.): Hrvatske pasmine domaćih životinja, Ministarstvo zaštite okoliša i prirodnog uređenja, Zagreb, 2002.
3. Senčić Đ., Antunović Z., Mijić P., Baban Mirjana, Puškadija Z. (2011): Ekološka zootehnika, Sveučilište Josipa Jurja Strossmayera u Osijeku, Poljoprivredni Fakultet u Osijeku, Osijek
4. Senčić, Đ., Antunović, Z. (2003): Ekološko stočarstvo, Katava – Osijek
5. Pintić V., Marenčić D., Pintić Pukec Nataša (2016): Hranidba domaćih životinja – odabrana poglavlja, Udžbenik, Visoko gospodarsko učilište u Križevcima.

*Supplementary:*

1. Huber H., (1992): Schweinefütterung-futtermittelhygiene, Leopold Stocker Verlag, Graz-Stuttgart.
2. Posavi M., Ozimec R., Ernoić M., Poljak F. (2003.): U potrazi za izgubljenim vremenom - enciklopedija hrvatskih domaćih životinja, Katarina Zrinski d.o.o. Varaždin
3. Horvath Š. (2003): Staro blago - novi sjaj - hrvatske izvorne pasmine, Barbat Zagreb. Zagreb
4. Senčić, Đ., Antunović, Z., Novoselec, J., Samac, D., Prakatur, I., Bobić, T. & Klir, Ž. (2021): Tehnologija animalne proizvodnje. Osijek. Fakultet agrobiotehničkih znanosti Osijek.

 Subject holder:

 Tatjana Jelen, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: elective** | **soil AnalysIs and fertilization** | **ECTS credits: 6** |
| **Code:** 154315 |  | Semester III |
| Teachers and associates: | **Andrija Špoljar, Ph. D., college professor****Ivka Kvaternjak, Ph. D., college professor** |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Introduce the students with field methods of soil sampling and sampling of plant materials, as well as with laboratory analysis of physical and chemical properties elaborated for purpose of fertilization. According to principles of sustainable and organic agricultural production the students will learn to level the quantities of fertilizer in line with good agricultural practice.

**SUBJECT DESCRIPTION:** "Soil and fertilizer analyses" is a two-subject module in which students prepare soil analyzes based on which they make fertilization recommendations on their own or selected agricultural holdings.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Analyses of soils and fertilization“ the student will be able to:*** |
| 1. Define basic terms from soil analysis and fertilization  |
| 2. Describe the procedures for conducting field and laboratory research  |
| 3. Make laboratory analyses  |
| 4. Interpret laboratory data  |
| 5. Calculate the amount of necessary fertilizers according to the principles of sustainable and ecological agricultural production  |
| 6. Use modern computer technologies  |
| 7. Recommend soil fertilization according to the principles of good agricultural practice  |
| 8. Write professional reports |

**Literature:**

*Obligatory:*

1. Vukadinović, V., Vukadinović, Vesna (2013): Ishrana bilja. Udžbenik, III dopunjeno izdanje, Sveučilište u Osijeku, Osijek, 442 str.
2. Pernar, N., Bakšić, D., Perković, I. (2013): Terenska i laboratorijska istraživanja tla. Udžbenik, Sveučilište u Zagrebu, Zagreb, 192 str.
3. Šimunić, I., Špoljar, A., Peremin Volf Tomislava (2007): Vježbe iz tloznanstva i popravka tla, skripta, Visoko gospodarsko učilište u Križevcima, Križevci.

*Supplementary:*

1. Bašić, F. (1982): Pedologija. Poljoprivredni institut Križevci, Sveučilište u Zagrebu, Zagreb.
2. Škorić, A. (1986): Priručnik za pedološka istraživanja. Fakultet poljoprivrednih znanosti Sveučilišta u Zagrebu, Zagreb.
3. Špoljar, A. (2015): Pedologija. Udžbenik, Visoko gospodarsko učilište u Križevcima, Križevci, 223. str.
4. Vukadinović, B., Bertić, B. (2013): Filozofija gnojidbe. Studio HS Internet do.o., Osijek, 127 str.

Subject holder:

Andrija Špoljar, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: elective** | **ACCOMMODATION HYGIENE, WELFARE AND SYSTEMS OF ANIMAL KEEPING** | **ECTS credits: 6** |
| **Code:** 215010 |  | Semester III |
| Teachers and associates: | **Damir Alagić, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Explain to the students the link between animal welfare and animal housing methods and differentiate physiological and pathological forms of behaviour; assess housing methods related to their impact on pollution of soil, water and air.

**SUBJECT DESCRIPTION:** The aim of the subject is to explain to students the connection between different systems of domestic animal husbandry and the impact on animal welfare. Describe and explain innate and acquired forms of behavior and state conditions contrary to the well-being of domestic animals. To train students to be able to explain and recognize the influence of microclimate factors on the breeding of domestic animals.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Hygiene, welfare and systems of animal keeping“ the student will be able to:*** |
| 1. Explain the difference between ecological and conventional lifestyle.  |
| 2. Analyze the influence of animal behavior on the occurrence of pathological forms of behavior.  |
| 3. Compare the impact of ecological and conventional livestock production on the pollution of water resources.  |
| 4. Explain the importance of continuous application of zootechnical measures to ecological animal breeding.  |
| 5. Explain the benefits of changes in the animal husbandry system with the aim of protecting animal welfare. |

**Literature:**

*Obligatory:*

1. Asaj, A. (1999): Dezinfekcija i dezinsekcija. Školska knjiga , Zagreb.
2. Asaj, A.(2003):Higijena na farmi i okolišu, Medicinska naklada, Zagreb
3. Grupa autora.,(2001): Ekološki leksikon,Ministarstvo zaštite okoliša i prostornog uređenja,Zagreb.
4. Senčić,Đ., B. Antunović(2004): Ekološko stočarstvo. Katava d.o.o., Osijek
5. Senčić,Đ., B. Antunović(2004): Ekološko stočarstvo. Katava d.o.o., Osijek
6. Valić,F., i sur(1994).:Zdravstvena ekologija,Sveučilišna naklada Liber, Zagreb,
7. Vučinić, M.(2006): Ponašanje, dobrobit i zaštita životinja, Beograd
8. Znaor,D (1996): Ekološka poljoprivreda. Nakladni zavod Globus, Zagreb

*Supplementary:*

1. Kozačinski,L., B. Njari, Ž. Cvrtila Fleck (2012): Veterinarsko javno zdravstvo i sigurnost hrane. Veterinarski fakultet Sveučilišta u Zagrebu.
2. Naglić, T., D. Hajsig, J. Madić, Ljiljana Pinter (2005): Praktikum opće mikrobiologije i imunologije. Školska knjiga, Zagreb
3. Ožegović, L., S. Pepeljnjak (2004): Mikotoksikoze. Školska knjiga, Zagreb.
4. Tofant Alenka, Marija Vučemilo (2003): Voda u veterini – potrebe i utjecaj na okoliš. Veterinarski fakultet Sveučilišta u Zagrebu
5. Vučemilo Marija, Tofant Alenka (1998): Higijena držanja i smještaja, okoliš i dobrobit životinja, Veterinarski fakultet Sveučilišta u Zagrebu
6. Narodne novine RH: Pozitivni zakonski propisi. NN Zagreb

 Subject holder:

Damir Alagić, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| **Subject: elective** | **Sustainable and organic production of seed and planting material** | **ECTS credits: 6** |
| **Code:** 154317 |  | Semester III |
| Teachers and associates: | **Vesna Samobor, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40  |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

To acquaint students with the principles of sustainable and ecological production of seed and planting material, breeding methods, directions in the selection of field crops, and the possibility of combining classical breeding with biotechnological methods in sustainable seed production.

**SUBJECT DESCRIPTION**: The aim of the Subject is to acquaint students with the principles of sustainable and ecological production of seed and planting material, breeding methods, directions in the selection of field crops, and the possibility of combining classical cultivation with biotechnological methods in sustainable seed production.

**Learning outcomes**

|  |
| --- |
| ***LEARNING OUTCOMES*****After completing the exam from the subject „Sustainable and organic production of seed and planting material“** |
| 1. Interpret legal regulations in sustainable and/or ecological production of seed and planting material, and the differences compared to conventional seed production  |
| 2. Explain the justification for starting seed production in our country  |
| 3. Assess the possibility of seed production of field crops in ecological production related to the soil and agroclimatic conditions of the area  |
| 4. Organize the seed cultivation of selected agricultural crops according to the principles of sustainable and/or ecological production  |
| 5. To analyze the seed production of arable crops on the selected farm  |
| 6. Propose the correct technology of seed production of a crop  |
| 7. Propose appropriate seed crop care measures, taking into account their efficiency and impact on the environment |

**Literature:**

*Obligatory:*

1. Boregon A. 2004. Control of seed borne diseasees in organic seed propagation. Proc. 1st World Conference on Organic Seed: Challenges and oportunities for organic agriculture and the seed industry. FAO Headquarters, Rome, Italy. pp. 170-171
2. Boregon A. 2004. Organic seed treatment to control common bunt (*Tilletia tritici*) in wheat. ISTA Seed Simp. Budapest, Hungary. Book of Abstracts:10.
3. Boregon A. 2004. Strategies for regulation of seed borne diseases in organic farming. Seed testing international - ISTA News Bulletin127:19-21.
4. Borgen A. 2002. Control of seed borne disease in organic cereals and legumes. Proc. 4th ISTA-PDC seed health symp.: Healthy seed the basis for sustainable farming. Wageningen. (p.18)
5. Connolly B. 2004. The wisdom of plant heritage: Organic seed production and saving. NOFA. Highland Press, Mass. (110 pages)
6. Lammerts van Bueren E.T and K.P. Wilbois (Eds.) 2002. Organic seed production and planr breeding – strategies, problems and perspectives. Proc. ECO-PB 1st Int. symp. on organic seed production and plant breeding. Berlin, Germany. (81 pages)

*Supplementary:*

1. Alvares C. 2009. The organic farming sourcebook. Other India Press and Third World Network. (464 pages)
2. Fisele J. and U. Köpke. 1996. Cereals: Optimizing competition against weeds. ….?
3. Haas G., U. Geier, D.G. Shultz und U. Köpke. 1996. A comparison of convential and organic agriculture - Part 1: climate-relevant carbondioxide emission from the use of fossil energy. ?
4. Jošt M. and V. Samobor. 2008. Breeding wheat for organic croping system. Proc. 2nd Mediteranean Conf. on Org. Acric. in Croatia. Dubrovnik. pp. 245-263.
5. Samobor V., D. Horvat, B. Kesteli and M. Jošt. 2008. Effect of stone meal on control of seed-borne diseases in wheat. Proc. 2nd Mediteranean Conf. on Org. Acric. in Croatia. Dubrovnik. pp. 323-332.
6. Turka I. 2002. Organic seed production and seed regulation. Proc. Int. Sci. and Practic. Conf.: Scientific aspects of organic farming.Jelgeva, Latvia.

Subject holder:

Vesna Samobor, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| **Subject: elective** | **QUALITY ASSESSMENT AND BIO-DYNAMICS OF ANIMAL PRODUCTS** | **ECTS credits: 6** |
| **Code:** 76 |  | Semester III |
| Teachers and associates: | **Tatjana Tušek, Ph. D., college professor** **Damir Alagić, Ph. D., college professor** |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Enable the student to use modern biotechnology in production, conservation and storage of animal products.

**SUBJECT DESCRIPTION:** Determining the quality, biodynamics of animal products is an elective subject for students of the professional graduate study in Agriculture, studying Sustainable and Organic Agriculture. The subject includes content on the biotechnology of foodstuffs of animal origin and the ecology of zero growth in the protection of foodstuffs, the application of protective cultures and mold cultures in the production, storage and improvement of the quality of foodstuffs of animal origin. It also deals with the application of modern packaging materials in hygienic and ecological approaches to the new marketing requirements of the market with product traceability and the application of the HACCAP system.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „Quality assessment and bio-dynamics of animal products“ the student will be able to:*** |
| 1. Compare biotechnology in canning and storage of animal food origin.  |
| 2. Identify critical points in the application of protective cultures and cultivated molds in the production, preservation and storage of foodstuffs of animal origin.  |
| 3. Decide on the method of removing critical points in the biotechnology of production, preservation and storage of foodstuffs of animal origin.  |
| 4. Assess which preservation methods have a positive effect on the quality of foods of animal origin and thereby reduce the possibility of infections and intoxications caused by foods of animal origin.  |
| 5. Explain the conservation method that increases the sustainability in the storage of animal products.  |
| 6. Differentiate packaging materials and their influence during storage of animal products in a modified atmosphere.  |
| 7. Plan an urgent notification system |

**Literature:**

*Obligatory:*

1. Asaj, A. (2006): Ekološko stočarstvo i homeopatija. Medicinska Naklada, Zagreb.
2. Duraković, S. (1996): Opća mikrobiologija. Durieux, Zagreb.
3. Duraković, S., F. Delaš, B. Stilinović, Lejla Duraković (2002): Moderna mikrobiologija namirnica. Udžbenici Sveučilišta u Zagrebu.
4. Duraković, S., Redžepović, S. (2005): Bakteriologija u biotehnologiji. Kugler, Zagreb.
5. Havranek, Jasmina, V. Rupić (1996): Mlijeko: dobivanje, čuvanje i kontrola. Hrvatski poljoprivredni zadružni savez, Zagreb.
6. Hadžiosmanović, M. i suradnici (2005.): Trendovi higijene i tehnologije namirnica kao sastavnice veterinarskog javnog zdravstva. Meso, 1, 20-27.
7. Hrvatska agencija za hranu (2008): HACCP; www hah.hr
8. Kozačinski L.,B. Njari, Ž. Cvrtila Fleck (2012): Veterinarsko javno zdravstvo i sigurnost hrane.Veterinarski fakultet Zagreb.
9. Naglić, T., D. Hajsig, J. Madić, Ljiljana Pinter (2005): Praktikum opće mikrobiologije i imunologije. Školska knjiga, Zagreb.
10. Ožegović, L., S. Pepeljnjak (2004): Mikotoksikoze. Školska knjiga, Zagreb.
11. Roseg, Đ. (1995): Prerada mesa i mlijeka. Nakladni zavod Globus, Zagreb.
12. Šoša, B. (1989): Higijena i tehnologija prerade morske ribe. Školska knjiga, Zagreb.
13. Živković, J. (1986): Higijena i tehnologija mesa; Kakvoća i prerada. Udžbenici Sveučilišta u Zagrebu.
14. Živković, J. (2001):U: Higijene i tehnologija mesa 1.dio. Veterinarsko sanitarni nadzor životinja za klanje i mesa(drugo dopunjeno izdanje). Udžbenici Sveučilišta u Zagrebu.
15. Narodne novine RH: Pozitivni zakonski propisi. NN Zagreb.

*Supplementary:*

1. Bonny, S. (1998): Biotechnology and the new information technologies in agriculture: development, prospects, impact and issues. Medit, 9, 1, 3.
2. Duraković, S., L. Duraković (1997): Priručnik za rad u mikrobiološkom laboratoriju-1. Durieux, Zagreb.
3. Duraković, S., S. Redžepović (2004): Bakteriologija u biotehnologiji, I i II dio. Školska knjiga, Zagreb.
4. Grupa autora (1995): Ribarstvo. Nakladni zavod Globus, Zagreb.
5. Grupa autora (1996,2012): Veterinarski priručnik. Medicinska naklada, Zagreb.
6. Havranek, Jasmina, V. Rupić (2003): Mlijeko: od farme do mljekare. Hrvatska mljekarska udruga, Zagreb.
7. International Commission on Microbiological Specifications for Foods (1980). Microbial Ecology of Foods, vol1., 2. Academic Press, Inc, New York.
8. Jennings, W. E. (1975): Food-Borneillness: U:Libby, J. A. Meat hygiene. Fourth Ed. Lea and Febiger, Philadelphia, Ch.11, p.p. 261-295.
9. Katalenić, M. (2004): Ciljevi, svrha i prvi rezultati hrvatskog sustava žurnog obavještavanja. Meso 3, 6-13.
10. Kozačinski,L., B. Njari, Ž. Cvrtila Fleck (2012): Veterinarsko javno zdravstvo i sigurnost hrane. Veterinarski fakultet Sveučilišta u Zagrebu.
11. Laciakova, A., M. Pipova, D. Maté, V. Laciak (2004): Nalaz gljivica tijekom mikrobiološke pretrage mesnih proizvoda. Meso, 5, 24-28.
12. Ostrŷ, V. (2001): The occurence of moulds in meat and meat products (II). Meso, 5, 20-24.

Subject holder:

Tatjana Tušek, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: elective** | **Sustainable and organic sheep and goat raising** | **ECTS credits: 6** |
| **Code:** 154322 |  | Semester: III |
| Teachers and associates: | **Tatjana Jelen, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Enable the students to independently organise sheep/goat production in line with the principles of sustainable and organic production.

**Learning outcomes**

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| --- |
| ***LEARNING OUTCOMES******After completing the exam from the subject „*Sustainable and organic sheep and goat raising” *the student will be able to:*** |
| 1. Distinguish between sheep and goat breeds, the most important properties and use in sustainable and ecological production  |
| 2. Explain welfare measures in organic farming and utilization of sheep and goats  |
| 3. Give an example of an appropriate way of carrying out selection and reproduction  |
| 4. To single out breeding technological procedures that are a prerequisite for starting sustainable/ecological sheep and goat farming on farms  |
| 5. Differentiate breeding methods in the production of meat, milk and/or wool.  |
| 6. Plan preventive and curative health care  |
| 7. Rank products by quality  |
| 8. Propose an appropriate way of raising sheep/goats  |
| 9. Create a sheep/goat feeding plan by category  |
| 10. Create guidelines for effective sustainable and/or ecological sheep/goat production based on an example from practice  |
| 11. Participate in team work and be able to present achieved results |

**Literature:**

*Obligatory:*

1. Senčić, Đ., Antunović, Z. (2003): Ekološko stočarstvo. Katava d.o.o., Osijek.
2. Senčić, Đ., Antunović, Z., Mijić, P., Baban, M., Puškadija, Z. (2011): Ekološka zootehnika, Sveučilišni udžbenik, Osijek
3. Uremović Z., Uremović, M., Filipović, D., Konjačić, M. (2008): Ekološko stočarstvo. Agronomski fakultet Sveučilišta u Zagrebu.

*Supplementary:*

1. Asaj, Antun (2006): Ekološko stočarstvo i homeopatija, Medicinska naklada Zagreb

Subject holder:

Tatjana Jelen, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: elective** | **Sustainable and organic production and technology of fodder** | **ECTS credits: 6** |
| **Code:** 154323 |  | Semester: III |
| Teachers and associates: | **Marcela Andreata – Koren, Ph. D., college professor** **Siniša Srečec, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Enable the participants to independently organise production of fodder in line with sustainable/organic principles and to apply contemporary procedures in fodder processing and storage.

**SUBJECT DESCRIPTION**: Basic features of sustainable management in fodder production (biodiversity, crop rotation, fertilization, protection...) and types of fodder plants suitable for sustainable management. The quality of granular agricultural products intended for processing into concentrated fodder. Tests and units for determining the correct quality of grain legumes. Harmful ingredients in the production chain of concentrated feed production. Modern technologies for the production of concentrated feed. Preparation of soybeans and cereals for the technological process of processing. Technical and technological peculiarities of dry extrusion. Peculiarities of the technological process of concentrated feed production.

**Learning outcomes**

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| ***LEARNING OUTCOMES*** ***After completing the exam from the subject „Sustainable and organic production and technology of fodder“ the student will be able to:*** |
| 1. List the basic measures and materials needed for sustainable and ecological fodder production  |
| 2. List different associations of forage plants with beneficial microorganisms  |
| 3. Assess the possibility of growing certain fodder crops in certain agro-climatic conditions  |
| 4. Plan agrotechnical measures for certain fodder crops  |
| 5. Assess the correctness of production and storage of forage plants and grassland on a certain farm  |
| 6. Assess the level of biological and chemical risks in raw materials for the production of concentrated animal feed,  |
| 7. To decide which technological process for the production of concentrated fodder will be applied in order to achieve the best utilization of concentrated fodder in livestock nutrition  |
| 8. Design a technological line for the production of concentrated fodder according to the given needs  |
| 9. Integrate existing technical solutions into a technological line that meets specific technological requirements,  |
| 10. Clearly formulate project tasks for designers of construction projects and machine lines for the construction of new production facilities for the production of concentrated animal feed.  |
| 11. List the basic measures and materials needed for sustainable and ecological fodder production |

**Literature:**

*Obligatory for studying and preparing for exam:*

1. Gagro, M. (1998): Ratarstvo obiteljskoga gospodarstva- Industrijsko i krmno bilje. Zagreb
2. Grupa autora (2004): Priručnik o proizvodnji i upotrebi stočne hrane-krme, Hrvatsko

agronomsko društvo, Zagreb

1. Katalinić, I., Pejaković, D., Brčić, J. (2000): Spremanje sjenaže, Zagreb.
2. Kovačević, V., Rastija, M. (2014): Žitarice. Poljoprivredni fakultet Osijek, Sveučilište JJS u Osijeku
3. Štafa, Z., Stjepanović, M. (2015): Ozime i fakultativne krmne kulture: proizvodnja i korištenje. HMU, Zagreb
4. Mršić, G., Špoljarić, D., Valpotić, H., Balenović, M., Kozačinski, L., Špoljarić, I., Valpotić, I., Savić, V., Srečec, S., Popović, M. (2011): Immunopredmetatory effects of white button *Agaricus bisporus* supplementation in broiler chickens. *Vetrinarska stanica,* 42(50): 431-439.
5. Pospišil, A. (2010): Ratarstvo 1. dio. Zrinski d.d., Čakovec
6. Rukavina, D., Tutavac, J. Bauman, I., Srečec, S. (2012): Food safety and quality management in agro food production chain: situation in Croatia. 47th Croatian and 7th International Symposium on Agriculture. Opatija. Croatia 13th to 17th February 2012. Proceedings, 141-149
7. Srečec, S., Štefanec, J., Pleadin, J., Bauman, I. (2013): Decreasing deoxynivalenol concentration in maize within the production chain of animal feed. *Agro Food Industry Hi Tech* 24(1): 62-64.
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9. Stjepanović, M., Zimmer, R, Tucak, M., Bukvić, G., Popović, S., Štafa, Z. (2009): Lucerna. Sveučilište Josipa Jurja Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku i Poljoprivredni institut Osijek/
10. Stjepanović, M., Štafa, Z. i Gordana Bukvić (2008):Trave za proizvodnju krme i sjemena.Hrvatska mljekarska udruga, Zagreb.
11. Štefanec, J. (2011): Promjena koncentracije deoksinivelanola (DON) u kukuruzu kroz proizvodni lanac proizvodnje stočne hrane. Završni specijalistički diplomski stručni rad. VGUK.
12. Znaor, D. (1996): Ekološka poljoprivreda, Nakladni zavod Globus, Zagreb.
13. www.mps.hr: Ekološka proizvodnja

*Supplementary:*

1. ENOF White book (1999). Organic farming research in the EU towards 21st century (Ed. J.

Isart & J.J. Lerena, Barcelona).

1. Forenbacher, Sergej. (1998): Otrovne biljke i biljna otrovanja životinja, Školska knjiga, Zagreb.
2. Znanstveni i stručni radovi na koje se upućuje tijekom predavanja.

 Subject holder:

 Marcela Andreata – Koren, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: elective** | **cultivating of medicinal and aromatic plants in sustainable and organic agriculture**  | **ECTS credits: 6** |
| **Code:** 167885 |  | Semester: III |
| Teachers and associates: | **Renata Erhatić, Ph. D., college professor**  |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

Introduce the students with basic morphological and biological characteristics of medicinal plant species with emphasis on agroecological conditions, i.e. cultivation technology in the scope of sustainable and organic production.

**SUBJECT DESCRIPTION:** The subject is an upgrade of the knowledge acquired at the professional study in the subject "Medicinal and Aromatic Herbs". Students are introduced to the general and specific features of medicinal and aromatic plants and the advantages of growing them in sustainable and ecological production before harvesting. They deal with systematics and morphology, active substances and the basics of production and processing technology of medicinal and aromatic plants according to the principles of sustainable and ecological production. Active participation of students in classes is foreseen through seminars and practical exercises in the laboratory and practicum, while field classes provide insight into concrete production processes.

**Learning outcomes**

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| ***LEARNING OUTCOMES******After completing the exam from the subject „Production of medicinal and aromatic plants in sustainable and organic agriculture “ the student will be able to:*** |
| 1. Describe the main commercial types of medicinal and aromatic plants (LJAMB) in the Republic of Croatia  |
| 2. To explain the specifics of the production of LJAMB species of the mentioned families in sustainable and ecological production  |
| 3. Show the production of LJAMB in sustainable and ecological production  |
| 4. To give an example of the appropriate technology of finishing and processing LJAMB species in sustainable and ecological production  |
| 5. Assess the quality and state the methods of application of LJAMB species in human nutrition |

**Literature:**

*Obligatory:*

1. Erhatić, R. (2017). Egzotične ljekovite biljne vrste, interna skripta
2. Igrec Barčić J., Maceljski, M. (2001): Ekološki prihvatljiva zaštita bilja od štetnika. Zrinski Čakovec.
3. Kisić, I. (2014): Uvod u ekološku poljoprivredu. Agronomski fakultet Sveučilišta u Zagrebu
4. Parađiković, N. (2014): Ljekovito i začinsko bilje. Nastavni materijal za predmet Ljekovito i začinsko bilje. Sveučilište Josipa Juraja Strossmayera u Osijeku. Poljoprivredni fakultet u Osijeku.
5. Pravilnik o ekološkoj proizvodnji (NN)
6. Pravilnik o sakupljanju zaštićenih samoniklih biljaka u svrhu prerade, trgovine i drugog prometa (NN)
7. Stepanović, B., Radanović, D., Turšić, I., Nemčević, N., Ivanec, J. (2009): Uzgoj ljekovitog i aromatičnog bilja. Jan-Spider, Pitomača
8. Šiješ, I., Grozdanić, Đ., Grgesina, I. (1992): Poznavanje, uzgoj i prerada ljekovitog bilja.

Školska knjiga, Zagreb.

1. Vukobratović, Ž., Vukobratović, M., Lončarić, Z.,Sikora S., Erhatić, R., Svržnjak, K. (2015): Korištenje kompostiranog biorazgradivog komunalnog otpada u održivoj poljoprivrednoj proizvodnji. Priručnik s rezultatima istraživanja. VIP projekt. Republika Hrvatska. Ministarstvo poljoprivrede.
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3. Znaor D. (1996): Ekološka poljoprivreda. Nakladni zavod „Globus“ Zagreb.
4. Kremer D. (2018). Ljekovito bilje Farmaceutskog botaničkog vrtra „Fran Kušan“, Denona d.o.o., Zagreb
5. Grdinić V., Kremer D. (2009). Ljekovito bilje i ljekovite droge: farmakoterapijski, botanički i farmaceutski podaci, Hrvatska ljekarnička komora, Zagreb
6. Voća S., Bilandžija D., Radman S., Šic Žlabur J. (2020). . Priručnik - Ekološki uzgoj ljekovitog i aromatičnog bilja. Projekt Zagrebačke Županije „Uvođenje i razvoj ekološke proizvodnje ljekovitog i začinskog bilja“, Zagreb

*Supplementary:*

1. Ašič, S. (1999): Priručnik za sakupljanje ljekovitog bilja. Dušević & Kršovnik. Rijeka
2. Domac, R. (2002): Flora Hrvatske. Školska knjiga Zagreb
3. Grlić, Lj. (1990): Enciklopedija samoniklog jestivog bilja. August Cesarec Zagreb
4. Kremer B.P. (2007): Ljekovito bilje. Vodič kroz prirodu. Naklada Begen. Sarajevo
5. Toplak Galle, K. (2005): Domaće ljekovito bilje. Mozaik knjiga Zagreb
6. Srečec S., Kremer D., Benković M., *i sur.* (2020.) Taksonomija, ekologija i uporaba rogača (Ceratonia siliqua L.) i lovora (Laurus nobilis L.) u Hrvatskoj. Tomić, F. i Peklić, I. (urednici). (znanstvena monografija) Zagreb, Križevci, Hrvatska akademija znanosti i umjetnosti. [ISBN 978-953-347-348-2]

 Subject holder:

 Renata Erhatić, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| --- | --- | --- |
| **Subject: elective** | **ecotourism**  | **ECTS credits: 6** |
| **Code:** 241315 |  | Semester: III |
| Teachers and associates: | **Sandra Kantar, Ph. D., college professor** **Kristina Svržnjak, Ph. D., college professor****Silvije Jerčinović, Ph. D., college professor** |
|  | Lessons |  |
| Lectures | 40 |
| Exercises + seminars  | 20 |

**SUBJECT OBJECTIVE:**

To acquire theoretical and practical knowledge about the resource and development basis of ecotourism

**SUBJECT DESCRIPTION:** The aim of the subject is to acquire theoretical and practical knowledge about the resource and development basis of ecotourism. Through the Subject, students will learn about the impact of ecotourism on the environment, and learn to design an ecotourism offer based on the natural beauties and protected parts of Croatia.

**Learning outcomes**

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| ***LEARNING OUTCOMES******After completing the exam from the subject „Production of medicinal and aromatic plants in sustainable and organic agriculture “ the student will be able to:*** |
| 1. Define and explain the basic characteristics of ecotourism and sustainable tourism  |
| 2. Recognize the importance of protected parts of nature as the basis for the development of ecotourism  |
| 3. List the economic, environmental, cultural and social potentials for the development of ecotourism  |
| 4. Describe the role of individual institutions and development documents in the function of ecotourism development  |
| 5. Based on the SWOT analysis, identify critical factors in the natural locality  |
| 6. Assess the importance of ecological agriculture and the market of ecological products for the development of ecotourism  |
| 7. Create proposals for different programs for ecotourism activities  |
| 8. Express clearly and with arguments about your views related to ecotourism  |
| 9. Create a seminar paper independently and present it to a wider audience. |

**Literature:**

*Obligatory:*

1. Bilen, M. (2011): Turizam i okoliš: Ekonomsko-geografski pristup izučavanju problematike), Mikrorad d.o.o., Zagreb.
2. Geić, S. (2011): Menadžment selektivnih oblika turizma, Split: Sveučilište u Splitu.
3. Klarić Z., Gatti, P. (2006): Ekoturizam u: Hrvatski turizam: plavo, bijelo, zeleno/ Sanda Čorak i sur. Zagreb, Institut za turizam (Znanstvena edicija Institut za turizam; knj. 3), str. 149-166.
4. Müller H., 2004: Turizam i ekologija, povezanost i područja djelovanja, Masmedia, Zagreb.
5. Zbornik radova 2. Kongresa eko i održivog turizma. Dostupno na: [http://www.lux-promocija.com/static/pdf/Zbornik%20radova\_2%20Kongresa%20eko%20i%20odrzivog%20turizma%20(1).pdf](http://www.lux-promocija.com/static/pdf/Zbornik%20radova_2%20Kongresa%20eko%20i%20odrzivog%20turizma%20%281%29.pdf)
6. Wearing, S., Neil, J. (2000), Ecotourism, Impacts, Potentials and Possibilities,Oxford: Butterworth-Heinemann, UK.

*Supplementary:*

1. Brčić-Stipčević, V., Petljak, K., Renko, S.(2010): Ekoagroturizam – pokretač održivog razvoja turizma, Ekonomski fakultet Zagreb. Dostupno na: <https://www.researchgate.net/publication/228357869_EKOAGROTURIZAM-POKRETAC_ODRZIVOG_RAZVOJA_TURIZMA>
2. Carić (2012): ODRŽIVI turizam u deset koraka: planiranje održivog turizma zasnovanog na baštini i prirodnom naslijeđu: priručnik za upravljanje i razvijanje turističkih regija, destinacija i proizvoda, Zagreb.
3. Ćurić, K. : Promišljanje razvoja ekoturizma i ekološke poljoprivrede, Praktični menadžment, Vol. I, br. 1, str. 98.-100. Dostupno na: <https://hrcak.srce.hr/file/101259>
4. Jafari, J (2000): The Encyclopedia of Tourism, Routledge, Taylor & Francis Group, London.
5. Kevy, A. (2014): Eko marketing – radna bilježnica.
6. Miljak, T., Bačić, L., Kitić, M. ( 2012): Ekoturizam kao poticaj razvoja poduzetništva u turizmu na primjeru Republike Hrvatske, Učenje za poduzetništvo , Vol. 2 No. 2. Dostupno na: [https://hrcak.srce.hr/clanak/192470#](https://hrcak.srce.hr/clanak/192470)
7. Pravdić, V. (2003). Sustainable development: its meaning, perception, and implementation The Case of Ecotourism in Croatia. Društvena istraživanja, 12 (3-4 (65-66)), 285-309. Preuzeto s <https://hrcak.srce.hr/19483>
8. Sundseth, K.(2010): Natura 2000 i ekoturizam u Hrvatskoj, Državni zavod za zaštitu prirode, Zagreb.
9. Svržnjak, K., i sur. (2014): Mogućnosti razvoja ekoturizma u Koprivničko-križevačkoj županiji, istraživačka studija. Dostupno na: <https://www.vguk.hr/multimedia/2fa45bc21b295ce757684815f05bb37e8e4e2db4476b00cfcc3fd246d3bf248cc85a0e761551101197.pdf>
10. The Encyclopedia of Ecotourism ed. by Weawer, D. (2001), Oxfordshire: CABI Publishing, UK.
11. Vidaković P. (1989): Nacionalni parkovi i turizam, Institut za turizam, Zagreb.

 Subject holder:

 Sandra Kantar, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| **Subject: obligatory** | **PROFESSIONAL PRACTICAL TRAINING** | **ECTS credits: 22** |
| **Code:** 104 |  | Semester IV |
| Teachers and associates: | **Marcela Andreata-Koren, Ph. D., college professor****Mentor of practical training at the College****Mentor of practical training outside the College** |
|  | Lessons |  |
| Practical training | 200 |
| Writing reports about practical training | 20 |

**SUBJECT OBJECTIVE:**

Apply and improve acquired knowledge and skills in a real work environment, record observations and create a critical review and/or conduct research for the final thesis.

**Learning outcomes**

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| ***LEARNING OUTCOMES******After completing the exam from the subject „Production of medicinal and aromatic plants in sustainable and organic agriculture “ the student will be able to:*** |
| 1. Describe the activity and organizational structure at the place of practice  |
| 2. Apply the acquired theoretical knowledge needed at the place of practice  |
| 3. Perform more complex tasks under supervision or independently  |
| 4. Solve a more complex problem in known circumstances  |
| 5. To look critically at the tasks performed at the place of practice and to be able to suggest improvements  |
| 6. Show entrepreneurship  |
| 7. Demonstrate negotiation skills  |
| 6. Effectively participate in teamwork  |
| 7. Make more complex decisions independently  |
| 8. Show better communication skills  |
| 9. It is better to express oneself in speech and writing |

**Literature:**

Literatura vezana uz djelatnost na mjestu obavljanja prakse.

Subject holder:

 Marcela Andreata-Koren, Ph. D., college professor

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 **KRIŽEVCI UNIVERSITY OF APPLIED SCIENCES**

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| **Subject: obligatory** | **ELABORATION OF FINAL GRADUATE PROFESSIONAL THESIS** | **ECTS credits: 8** |
| **Code:** 105 |  | Semester IV |
| Teachers and associates: | **Committee for defence of graduate professional thesis (mentor, head of the Committee, member of the Committee)** |
|  | Lessons |  |
| Elaboration of final graduate professional thesis | 80 |