Sveučilište u Zagrebu Agronomski fakultet
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Grassland Management Systems (296595)

Nositelj kolegija

prof. dr. sc. Marina Vranić

Opis kolegija

This course is designed to develop the technical knowledge and skills required by those who may go on to meadows and pastures management for forage production and utilization. The programme provides a full range of grass and legume production and utilisation topics consisting of: (i) meadow & pasture description and economy for animal production (ii) adaptation and use of forage grasses, legumes & grass-legume mixtures for grazing, conservation & combined utilization; (iii) meadow management systems (establishment and fertilization, mowing), meadow lifespan; (iv) grass and legume production on meadows (fresh and conserved) (v) pasture management systems (establishment and fertilization, mowing), pasture lifespan; (vi) grazing management (estimate of available forage, pasture stocking rate, grazing methods); (vii) on-farm grazing plan (paddock size, location and arrangement); (viii) the nutritive value of forages from meadows & pastures (indicates of forage quality, chemical, physical and biological methods for forage evaluation, the interpreting forage analysis report); (ix) remote sensing in forage evaluation.

ECTS: **3.00**

Engleski jezik: **R1**

E-učenje: **R1**

Sati nastave: 30
Predavanja: 12
Laboratorijske vježbe: 9
Seminar: 6
Terenske vježbe: 3

Izvođač predavanja

- prof. dr. sc. Krešimir Bošnjak

Ocjenjivanje

Dovoljan (2): 60-69 %
Dobar (3): 70-79 %
Vrlo dobar (4): 80-89 %
Izvrstan (5): >90%

Vrsta kolegija

- Undergraduate studies / BS Courses taught in English (Izborni kolegij, 1. semestar, 1. godina)

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Opće kompetencije

Upon completion of the module students are able to recognize different grass and clover species, to plan on-farm grazing system, to recomend grass clover mixtures, to determine the optimal phase of plant phenological phase for harvesting and for grazing, to choose the appropriate technology for forage conservation and can understand the analytical report of the produced forage.

Oblici nastave

- Lectures
  mostly held at the experimental Grassland Research Station on Medvednica mount which is about 40km away from the Faculty where the students receive transportation to.
- Laboratory practice/exercises
  include an introduction to forage sampling and laboratory equipment used for the determination of forage basic chemical composition by wet chemistry or by NIR spectroscopy. Students become familiar with the basic chemical parameters determined in the lab and their influence on forage nutritive value. Student is asked to analyze a couple of forage samples by NR spectroscopy and to read the analytical report.
- Field work
  include a tour around the experimental Grassland Research Station which enables students to detect certain forage types, to understand current grassland experiments, to see the field equipment and machinery used for forage conservation and feeding with en emphasis on big bale haylage production.
- Seminars
  throughout the semester, the student is obligated to make the seminar and present it during lectures. The seminar covers 4 pages written in the World and 10-15 minutes of power point presentation.

Ishodi učenja i način provjere

Ishod učenja	Način provjere
Students will be able to describe basic forage production systems.	Class discussion, seminar, oral exam
Students will be able to identify and describe basic grass and clover species in terms of biological aspects of grow, their management and recommended utilisation.	Discussion, writing test
Students will be able to compose grass & clover mixture for mowing, grazing, combined utilisation conferring tolerance to defoliation frequency and to drought, nutrient, and winter stresses.	Discussion, writing test, oral exam
Students will be able to describe and compare agro-technology applied for meadow and pasture management the year around.	Class discussion, seminar
Students will be able to focus the principles of forage conservation/pasture and grazing management toward practical approaches to resource conservation and livestock production.	Practical work, field trip, oral exam
Students will be able to design on-farm grazing plan.	Seminar, field discussion

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Način rada

Obveze nastavnika

Teachers are expected to keep records on the class attendence, to keep students informed on the planned activities, to explaine all the the topics involved in the class, to specify seminar topics on time, to discuss more topics on the students' interest, to prepare writing exams and to evaluate students work throught semester.

Obveze studenta

The student should regularly attend classes, meet the obligations throught the semester and successfully pass seminar work, writing exams and the final exam.

Polaganje ispita

Elementi praćenja	Maksimalno bodova ili udio u ocjeni	Bodovna skala ocjena	Ocjena	Broj sati izravne nastave	Ukupni broj sati rada prosječnog studenta	ECTS bodovi
Seminar essay	50	up to 20 21-25 26-30 31-35 36-40	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)			0.5
Class attendance and participation	50	up to 20 21-25 26-30 31-35 36-40	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)			0.5
Major (hour) tests	100	up to 60 61-70 71-80 81-90 91-100	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)			1
Final exam	100	up to 60 61-70 71-80 81-90 91-100	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)			1
Total	300					3

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Tjedni plan nastave

1. Course introduction, meadow & pasture description and economy for animal production - Definition of ‘grassland’ and description of meadows and pastures; classification of natural and introduced, importance in terms of hectarage and productivity and their economy for animal production.
2. Adaptation and use of forage grasses and legumes - Adaptation and use of forage grasses and legumes for pasture/conserved feed, physiological attributes of forage species, ecophysiological adaptations of species to prevailing environmental and managerial factors; required agro-technology
3. Grass and legume mixtures - Grass-legume mixtures for mowing, grazing, combined utilization.
4. Meadow management systems - Establishment and fertilization: methods of seeding, renovation and rejuvenation; inoculation, companion planting, weed control; mowing (plant maturity stage, height, frequency). Sward lifespan: management and maintenance practices.
5. Grass and legume production on meadows - Green and conserved forage management: hay & silage, production systems; timing, processing and storage.
6. Pasture management systems - Establishment and fertilization: methods of seeding, renovation and rejuvenation; inoculation, companion planting, weed control. Sward lifespan: management and maintenance practices. Managed grazing systems; balancing seasonal variations in supply and demand; utilization efficiency. Effects of grazing animals on pastures.
7. G Grazing management - Pastures utilization by grazing & combined pasture utilisation (mowing & grazing). An estimate of available forage (deciding when to move animals to a fresh paddock), pasture stocking rate.
8. Grazing management - Grazing methods (continuous and rotational stocking, strip grazing, creep grazing, forward creep grazing, limit grazing).
9. On-farm grazing plan - Fencing (types of fences, posts, length of lanes, gates), corridors, watering points, shadows, salting points. Paddock size, location and arrangement, on-farm grazing plan.
10. Nutritive value of forages from meadows & pastures - Indices of forage quality; determinants of intake; digestibility; nutrient content; changes with maturity and with time in season; anti-quality factors; quality relative to nutritive demand of different class of livestock. Chemical, physical and biological methods for forage evaluation and the interpreting forage
11. Remote sensing in forage evaluation - Application of remote sensing techniques in forage evaluation
12. -
13. -
14. -
15. -

Obvezna literatura

1. Hopkins, A. (ed) (2000) Grass its production and utilization, Blackwell Science.
2. Ball, D.M., Hoveland, C.S., Lacefield, G.D. (2002.): Southern Forages. Third edition. Published by the Potash & Phosphate Institute (PPI), Georgia, USA.
3. Barnes, R.F., (ed) (2007) Forages- the science of grassland agriculture, Blackwell Publishing
4. Cherney, J.H. i Cherney, D.J.R. (1998) Grass for Dairy Cattle, CABI Publishing

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Preporučena literatura

1. Lemaire, G. (ed.) (2000) Grassland Ecophysiology and Grazing Ecology, CABI Publishing
2. Frame, J. (ed.) (1988) Efficient beef production from grass (odabrana poglavlja) BGS publication
3. Davies, A., Baker, R. D., Grant, S. A. and Laidlaw, A. S. (ed.) (1998) Sward measurement handbook BGS publication
4. Cherney, J. H. and Cherney, D. J. R. (ed.) (1998) Grass for dairy cattle, CABI publishing
5. Whitehead, D. C. (2000) Nutrient elements in grassland: soil-plant-animal relationships, CABI Publishing
6. Hodgson, J.(ed.) (1998) The Ecology and Management of Grazing Systems, CABI Publishing
7. Tow, P. (ed.) (2001) Competition and Succession in Pastures, CABI Publishing

Sličan kolegij na srodnim sveučilištima

- Grassland Science, University of Wageningen

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