Sveučilište u Zagrebu Agronomski fakultet
Svetošimunska cesta 25, 10000 Zagreb
Telefon: +385 (0)1 2393 777
E-mail: dekanat@agr.hr
Web: www.agr.unizg.hr

Ecological aspects of grassland management (146064)

Nositelj kolegija

prof. dr. sc. Marina Vranić

Opis kolegija

1. to define and explain the multifunctional role of grasslands
2. to describe morphological and phenological grass/legume charactersitics and their impact on grassland management
3. to summarize the influence of climatic changes on grassland production
4. to define and to explain the plant interrelationships in grassland communities
5. to define and to explain plant-animal relationship that influence grassland management
6. to analyse the impact of grassland management on N, P, K cycling in grassland ecosystem
7. to analyse the impact of grassland management on organic matter turnover and C sequestration in grassland ecosystems
8. to summarize eco-physiological influence on the efficiency of grassland utilisation in forage production
9. to define the concept of sustainable grassland management and to summarize grassland management measures in sustainable forage production models based on grassland
10 Monitoring methods for the evaluation of ecological impact of grassland management

ECTS: **6.00**

Engleski jezik: **R1**

E-učenje: **R1**

Sati nastave: 60
Predavanja: 21
Auditorne vježbe: 12
Vježbe u praktikumu: 7
Seminar: 20

Izvođač predavanja

- prof. dr. sc. Krešimir Bošnjak

Ocjenjivanje

Dovoljan (2): 50%
Dobar (3): 60%
Vrlo dobar (4): 70%
Izvrstan (5): 80%

Vrsta kolegija

- Graduate studies / Environment, agriculture and resource management (Izborni kolegij, 4. semestar, 2. godina)

Developed by Superfluo d.o.o. • www.superfluo.hr

Sveučilište u Zagrebu Agronomski fakultet
Svetošimunska cesta 25, 10000 Zagreb
Telefon: +385 (0)1 2393 777
E-mail: dekanat@agr.hr
Web: www.agr.unizg.hr

Opće kompetencije

The course enables students to understand basic biological phenomena, relationships and monitoring the grasslandsas a basis for the understanding and application in practice.

Oblici nastave

- Lectures
  Students at least 4x through a semester attend classes at Grassland Research Station Sljeme where they become familiar with the practical aspects of certain teaching units.
- Auditory Exercises
  Students become familiar with on-coming reasearch covering ecological aspects of grassland management.
- Laboratory practice/exercises
  Students are introduced into lab equipment and lab analysis used for forage quality assesment.
- Seminars
  Student prepare and present two seminars throught the semester.

Ishodi učenja i način provjere

Ishod učenja	Način provjere
Students will be able to define and explain the multifunctional role of grasslands	Class discussion, seminar, oral exam
Students will be able to describe morphological and phenological grass/legume charactersitics and their impact on grassland management	Discussion, writing test
Students will be able to summarize the influence of climatic changes on grassland production	Discussion, writing test, oral exam
Students will be able to define and to explain the plant interrelationships in grassland communities	Class discussion, seminar
Students will be able to define and to explain plant-animal relationship that influence grassland management	Practical work, field trip, oral exam
Students will be able to analyse the impact of grassland management on N, P, K cycling in grassland ecosystem	Laboratory practise
Students will be able to analyse the impact of grassland management on organic matter turnover and C sequestration in grassland ecosystems	Class discussion, seminar, oral exam
Students will be able to summarize eco-physiological influence on the efficiency of grassland utilisation in forage production	Discussion, writing test, field trip
Students will be able to define the concept of sustainable grassland management and to summarize grassland management measures in sustainable forage production models based on grassland	Discussion, writing test, oral exam
Students will be able to monitor methods for the evaluation of ecological impact of grassland management	Class discussion, seminar

Developed by Superfluo d.o.o. • www.superfluo.hr

Sveučilište u Zagrebu Agronomski fakultet
Svetošimunska cesta 25, 10000 Zagreb
Telefon: +385 (0)1 2393 777
E-mail: dekanat@agr.hr
Web: www.agr.unizg.hr

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	0-20 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	0-20 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	0-60 61-70 71-80 81-90 91-100	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)			1
Final exam	100	0-60 61-70 71-80 81-90 91-100	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)			1
Total	300					3

Tjedni plan nastave

1. Multifunctional role of grasslands. Morphology and phenology of grasses and legumes and grassland management E+L - Multifunctional role of grasslands - for domestic animals (and wildlife); maintaening biodiversity on habitat and plant species level; conservation of landscape diversity; soil and water conservation; C sequestration; contribution of grasslands to the rural economy. Grass morphology and phenology, legume morphology and phenology.
2. Morphology and phenology of grasses and legumes and grassland management E - Grass morphology and phenology, legume morphology and phenology.
3. Elements of the environment and grassland management L, S - Temperature, light, water,

Developed by Superfluo d.o.o. • www.superfluo.hr

Sveučilište u Zagrebu Agronomski fakultet
Svetošimunska cesta 25, 10000 Zagreb
Telefon: +385 (0)1 2393 777
E-mail: dekanat@agr.hr
Web: www.agr.unizg.hr

nutrients; grassland management and the climate change.

4. Elements of the environment and grassland management. Grassland ecology, plant interrelationship. L+S+E - Temperature, light, water, nutrients; grassland management and the climate change. Sward structure elements; tiller dynamics in grasslands; plant competition relationships, morphological grass plasticity; ecological aspcts of grass-clover mixtures and implications on grassland management.
5. Grassland ecology, plant interrelationship E, S - Sward structure elements; tiller dynamics in grasslands; plant competition relationships, morphological grass plasticity; ecological aspcts of grass-clover mixtures and implications on grassland management.
6. Grassland ecology, plant interrelationship. Grassland ecology - plant-animal interrelationship. E+S+L - Sward structure elements; tiller dynamics in grasslands; plant competition relationships, morphological grass plasticity; ecological aspcts of grass-clover mixtures and implications on grassland management. Herbivore impact on plant competition in established grassland; the influence of grazing system on plant competition.
7. Grassland ecology - plant-animal interrelationship L, E - Herbivore impact on plant competition in established grassland; the influence of grazing system on plant competition.
8. Nutrient cycling in forage production on grasslands L, S - N, P, K cycling, the influence of N on plant growth and development; N use efficiency and the effect of N application on grassland productivity and quality.
9. Nutrient cycling in forage production on grasslands. The influence of grassland management on organic matter turnover and C sequestration. L+S - N, P, K cycling, the influence of N on plant growth and development; N use efficiency and the effect of N application on grassland productivity and quality. The influence of grassland management on accumulation and organic matter turnover in grassland; the utilisation of reserved C for plant regrowth, the role of grassland in C sequestration.
10. The influence of grassland management on organic matter turnover and C sequestration L, S - The influence of grassland management on accumulation and organic matter turnover in grassland; the utilisation of reserved C for plant regrowth, the role of grassland in C sequestration.
11. The influence of grassland management on organic matter turnover and C sequestration. Grassland ecophysiology and management measures L+E+S - The influence of grassland management on accumulation and organic matter turnover in grassland; the utilisation of reserved C for plant regrowth, the role of grassland in C sequestration. Grassland yield formation - growth and utilisation; intake on grazed garsslands; grassland structure heterogenity and the efficiency of grass utilisation; sward regrowth; the influence of residual sward height and optimum time of utilisation; sward growth curve - seasonal patterns of grass production and utilization.
12. Grassland ecophysiology and management measures L, E, S - Grassland yield formation - growth and utilisation; intake on grazed garsslands; grassland structure heterogenity and the efficiency of grass utilisation; sward regrowth; the influence of residual sward height and optimum time of utilisation; sward growth curve - seasonal patterns of grass production and utilization.
13. Sustainable grassland management L - Measures within the sustainable management systems on graslands.
14. Basic monitoring methods for the evaluation of ecological impact of grassland management E, S - Sampling and data analysis on level of individual plant and population, Spatial data analysis with GIS, Research potential and techniques of RS (remote sensing)
15. Basic monitoring methods for the evaluation of ecological impact of grassland management E, S - Sampling and data analysis on level of individual plant and population, Spatial data analysis with GIS, Research potential and techniques of RS (remote sensing)

Developed by Superfluo d.o.o. • www.superfluo.hr

Sveučilište u Zagrebu Agronomski fakultet
Svetošimunska cesta 25, 10000 Zagreb
Telefon: +385 (0)1 2393 777
E-mail: dekanat@agr.hr
Web: www.agr.unizg.hr

Obvezna literatura

1. Hopkins, A. (ur) (2000) Grass its production and utilization, Blackwell Science.
2. Barnes, R.F., (ur) (2007) Forages- the science of grassland agriculture, Blackwell Publishing
3. Lemaire, G. (ur.) (2000) Grassland Ecophysiology and Grazing Ecology, CABI Publishing
4. Tow, P. (ur.) (2001) Competition and Succession in Pastures, CABI Publishing

Preporučena literatura

1. Hodgson, J.(ur.) (1998) The Ecology and Management of Grazing Systems, CABI Publishing
2. Whitehead, D. C. (2000) Nutrient elements in grassland: soil-plant-animal relationships, CABI Publishing
3. Cherney, J.H. i Cherney, D.J.R. (1998) Grass for Dairy Cattle, CABI Publishing

Sličan kolegij na srodnim sveučilištima

- Grassland Ecology and Management, University of Nebraska Lincoln Crop ecology, University of Georgia

Developed by Superfluo d.o.o. • www.superfluo.hr