Sveučilište u Zagrebu Agronomski fakultet
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Quantitative methods for agriculture and environment science (169512)

Nositelj kolegija

doc. dr. sc. Biserka Kolarec

Opis kolegija

Calculus: Exploring of mathematical approaches and solutions that cut across agriculture and environmental disciplines and introducing of analytical techniques that are thought infrequently in other courses. The goal is to provide students with the tools and confidence they need to apply quantitative methods in their own research (differential and integral calculus, multivariable calculus, with examples and applications from the environmental sciences).

ECTS: **3.00**

Sati nastave: 30
Predavanja: 20
Auditorne vježbe: 10

Izvođač predavanja

- doc. dr. sc. Biserka Kolarec

Izvođač vježbi

- doc. dr. sc. Biserka Kolarec

Ocjenjivanje

Dovoljan (2): 60-70 %
Dobar (3): 71-80 %
Vrlo dobar (4): 81 -90%
Izvrstan (5): 91-100%

Vrsta kolegija

- Graduate studies / Environment, agriculture and resource management (Obvezni kolegij, 1. semestar, 1. godina)

Opće kompetencije

This course introduces the use of quantitative methods in environmental analysis. Students will learn how to apply basic principles of natural science to a variety of globally important problems.

Oblici nastave

- Lectures
- Auditory Exercises
- Practicum

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Ishodi učenja i način provjere

Ishod učenja	Način provjere
have working knowledge of basic concepts, methods and techniques from calculus;	exam, practical work, project
be able to apply mathematical knowledge, insights and methods to solve basic problems in life sciences (agriculture and environment) using a systematic approach;	exam, practical work, project
be able to critically reflect upon the results;	exam, practical work, project
be able to interpret the results in terms of the problem that was modelled mathematically;	exam, practical work, project
be able to use mathematical software in elaborating mathematical models.	exam, practical work, project

Način rada

Obveze nastavnika

1. Course planning
2. Selection and creation of teaching materials
3. Evaluation of course, teaching materials and curriculum
4. Construct tests
5. Grade students on the basis of their achievement

Obveze studenta

1. Attend lectures regularly
2. Do homeworks and participate actively during lectures
3. Write tests and win at least 25% of points on each test to get the signature
4. Do individual projects

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
1st exam	40 %			14	20	1
2nd exam	30 %			8	20	1
3rd exam	30 %			8	20	1
activity	up to 10 %					
Total	100 %			30	60	3

Elementi praćenja	Opis	Rok	Nadoknada
3rd Exam	functions of several variables	16th week	

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Tjedni plan nastave

1. Introduction L - Survey of elementary functions. Real functions of one real variable
2. Differential of a function L - Limit, derivative, interpretations of derivative, differential of a function, tabular differentiation
3. Differentiation techniques E - Differentiation techniques, higher order derivatives
4. Minimum and maximum problems I L+E - Applications to minimum and maximum problems
5. Minimum and maximum problems II E - Exercises on minimum and maximum problems
6. Integration I L - Definite and indefinite integrals, Newton-Leibnitz formula
7. Integration II E - Methods of finding indefinite integrals
8. Differential equations I L - Basic concepts and methods of solving
9. Differential equations II L+E - Methods of solving
10. Differential equations III E - Solving differential equations
11. Matrix algebra I L - Survey of matrix algebra, determinants, eigenvalues and eigenvectors
12. Matrix algebra II E - Exercises on matrix algebra
13. Functions of several variables I L - Partial derivatives and differentials of functions of several variables
14. Functions of several variables II L+E - Maximum and minimum of functions of several variables
15. Functions of several variables III E - Exercises on maximum and minimum of functions of several variables

Preporučena literatura

1. L. D. Hoffman, G. L. Bradley: Calculus for Business, Economics, and the Social and Life Sciences
2. K. Sydsaeter, P. J. Hammond: Mathematics for Economic Analysis, Prentice Hall, 2002
3. K. Sydsaeter, P. J. Hammond, A. Seierstad, A. Strom: Further Mathematics for Economic Analysis, Prentice Hall, 2008
4. M. W. Klein: Mathematical methods for economics, Pearson Education, 2002.

Sličan kolegij na srodnim sveučilištima

- Mathematik, BOKU, Wien
- Mathematik und Statistik, Agricultural Sciences, University of Hohenheim

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