30803 - Mathematics

Información del Plan Docente

Academic Year	2016/17
Academic center	105 - Facultad de Veterinaria
Degree	568 - Degree in Food Science and Technology
ECTS	6.0
Course	1
Period	First semester
Subject Type	Basic Education
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning process that is designed for this subject is based on ....
The course is divided into 30 master classes participatory one hour, and 30 hours of practice in computer classroom. Regarding participatory lectures are devoted 5 hours for each of the six blocks in which the subject is distributed. The documentation for each topic is housed in advance in a virtual course that students have access throughout the course. Thus, the student can review it in detail before and after the corresponding class. The material is left available to students includes presentations of the theoretical concepts, such as collections of solved problems and proposed for each of them. Thanks to the tools used in the configuration of the virtual course, the materials are neatly organized in each of the six blocks in which the subject is divided. In general, we will try to encourage participation in class through a system based on problem solving learning.

Practices are held at computer classroom sessions one or two hours. For each block, will be two two-hour practices which will be made to the approach and resolution models using spreadsheet, algebraic manipulators and specific applications. In addition, each block will end with a practice of one hour also in computer room, where the student must solve individually similar to those worked both in lectures and in practical situations. As in the theoretical part, the virtual course will host the scripts and support for the implementation of these practices and will be where students must accommodate documents generated in each practice for later evaluation.
Both the theoretical to the practical, in addition to face tutorials, the messaging system and news offered by the virtual course to maintain permanent contact with students is used.

5.2.Learning activities

The program that the student is offered to help you achieve the expected results includes the following activities
Block I. Real function of a real variable
Descriptors: Limits and continuity. Differential calculus in R. Applications of Differential Calculus. Function Graphing. Integration of functions in R and integration techniques. Applications of Integral Calculus.
competencies:
Knowing how to interpret the basic concepts related to real functions of real variable, what a derivative, how it appears in real trouble means, how important is the concept of continuity in real situations.
Know how the graph of a real function of real variable and interpret the same within each real context to draw conclusions about the evolution of the process that represents, so that decisions can be made about it.
Knowing how to interpret the meaning of the concept of integral beyond its theoretical definition. Knowing the simplest techniques of resolution of Integral Calculus. Knowing the various real situations in which they are integral in the modeling problem.
instrumental generic competences listed above appear implicit in all these competitions.
Teaching and learning activities: 1 ECTS
- Lectures: 5 hours (the contents of the descriptors will work). It will seek to encourage participation in class through a system based on problem solving learning.
- Practice in computer room: 2 Practical 2 h each for the approach and resolution models using spreadsheet, algebraic manipulators and specific applications.
- Study by the student: 14 hours of autonomous work by the student. Within these hours possible assistance to individual tutorials are posted.
Evaluation:
a practice will be held in computer room block at the end of 1 hour, where the student must solve individually similar to those worked both in lectures and in practical situations.
Block II. numerical approximation
Descriptors: Approximate Solving equations, methods of bisection and Newton-Raphson. Interpolation and approximation, Taylor polynomials, Lagrange method, Newton's method, least squares. Numerical calculation of derivatives and numerical integration methods differences, rectangle rule, midpoint, trapeze and Simpson.
competencies:
To recognize when you can not know the exact solution of an equation and, in that case, know how to choose and apply the best method to find an approximate solution. Knowing how to interpret the approach found in the context of the problem, through discussion and analysis of results.
Knowing how to find the best function that approximates a set of experimental data taken in context of the real problem, making the right decision through critical reasoning.
Knowing how to recognize situations where a derivative or integral must be solved approximately. Apply the appropriate methods to locate the best approach in each case, interpreting the solution.
Knowing when to terminate approximation methods used in this block as the actual context of the problem to be solved, for which a proper application of analytical skills will be used.
Knowing master different applications relating to the field of study and use of the Internet as a means of communication and source of information.
Teaching and learning activities: 1 ECTS
- Lectures: 5 hours (the contents of the descriptors will work). It will seek to encourage participation in class through a system based on problem solving learning.
- Practice in computer room: 2 Practical 2 h each for the approach and resolution models using spreadsheet, algebraic manipulators and specific applications.
- Study by the student: 14 hours of autonomous work by the student. Within these hours possible assistance to individual

tutorials are posted.
Evaluation:
a practice will be held in computer room block at the end of 1 hour, where the student must solve individually similar to those worked both in lectures and in practical situations.
Block III. Systems of linear equations
Descriptors: Fundamentals of matrices. Elimination method Gauss-Jordan.
competencies:
Knowing model real problems in terms of matrices. Knowing represent systems of linear equations in terms of matrices and vice versa.
Knowing solving a system of linear equations in matrix form using iterative methods.
Can analyze which method is most appropriate to address each specific situation, by means of a critical reasoning.
Knowing master different applications relating to the field of study and use of the Internet as a means of communication and source of information.
Teaching and learning activities: 1 ECTS
- Lectures: 5 hours (the contents of the descriptors will work). It will seek to encourage participation in class through a system based on problem solving learning.
- Practice in computer room: 2 Practical 2 h each for the approach and resolution models using spreadsheet, algebraic manipulators and specific applications.
- Study by the student: 14 hours of autonomous work by the student. Within these hours possible assistance to individual tutorials are posted.
Evaluation:
a practice will be held in computer room block at the end of 1 hour, where the student must solve individually similar to those worked both in lectures and in practical situations.
Block IV. First order differential equations
Descriptors: Classification and exact solving differential equations of the first order.
competencies:
To recognize the different contexts in which the first-order differential equations in the modeling of the problem appear.
Know how to apply theoretical knowledge to analyze the situation, classify differential equations and choose the exact resolution method (if any).
Knowing master different applications relating to the field of study and use of the Internet as a means of communication and source of information.
Teaching and learning activities: 1 ECTS
- Lectures: 5 hours (the contents of the descriptors will work). It will seek to encourage participation in class through a system based on problem solving learning.
- Practice in computer room: 2 Practical 2 h each for the approach and resolution models using spreadsheet, algebraic manipulators and specific applications.
- Study by the student: 15 hours of autonomous work by the student. Within these hours possible assistance to individual tutorials are posted.
Evaluation:
a practice will be held in computer room block at the end of 1 hour, where the student must solve individually similar to those worked both in lectures and in practical situations.
Block V. Linear Optimization
Descriptors: Problem of Linear Programming. graphic resolution.
competencies:
Knowing how to interpret the meaning of the concept of optimization in its most general expression as well as the multitude of problems that appears.
To recognize the situations in which the linear programming model is presented in different real contexts. Distinguish the most significant cases.
Intuitively know how to solve and accurate linear optimization problems where only two variables appear so.
Knowing master different applications relating to the field of study and use of the Internet as a means of communication and source of information.
Teaching and learning activities: 1 ECTS
- Lectures: 5 hours (the contents of the descriptors will work). It will seek to encourage participation in class through a system based on problem solving learning.
- Practice in computer room: 2 Practical 2 h each for the approach and resolution models using spreadsheet, algebraic manipulators and specific applications.
- Study by the student: 15 hours of autonomous work by the student. Within these hours possible assistance to individual

tutorials are posted.
Evaluation:
a practice will be held in computer room block at the end of 1 hour, where the student must solve individually similar to those worked both in lectures and in practical situations.
Block VI. Statistics
Descriptors: Descriptive statistics. Analysis of data. Random variable models and Probability Distributions important.
competencies:
Know the basics of descriptive statistics. Know how to make a quantitative analysis of data from a sample experimentally. Knowing how to interpret the results of the qualitative analysis and subsequent contextualization in the concrete real problem.
Knowing understand the meaning of the concept of random variable, from a very practical point of view. Know what the most important Probability distributions are well know to identify with real situations drawn from the collection of experimental data.
Knowing master different applications relating to the field of study and use of the Internet as a means of communication and source of information.
Teaching and learning activities: 1 ECTS
- Lectures: 5 hours (the contents of the descriptors will work). It will seek to encourage participation in class through a system based on problem solving learning.
- Practice in computer room: 2 Practical 2 h each for the approach and resolution models using spreadsheet, algebraic manipulators and specific applications.
- Study by the student: 15 hours of autonomous work by the student. Within these hours possible assistance to individual tutorials are posted.
Evaluation:
a practice will be held in computer room block at the end of 1 hour, where the student must solve individually similar to those worked both in lectures and in practical situations.

5.3.Program

Block I. Real function of a real variable

Descriptors: Limits and continuity. Differential calculus in R. Applications of Differential Calculus. Function Graphing. Integration of functions in R and integration techniques. Applications of Integral Calculus.

Block II. Numerical approximation

Descriptors: Approximate solving equations, methods of bisection and Newton-Raphson. Interpolation and approximation, Taylor polynomials, Lagrange method, Newton's method, least squares. Numerical calculation of derivatives and numerical integration methods differences, rectangle rule, midpoint, trapeze and Simpson.

Block III. Systems of linear equations

Descriptors: Fundamentals of matrices. Elimination Gauss-Jordan method.

Block IV. First order differential equations

Descriptors: Classification and exact solving differential equations of the first order.

Block V. Linear optimization

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Descriptors: Problem of Linear Programming. Graphic resolution.

Block VI. Statistics

Descriptors: Descriptive statistics. Analysis of data. Random variable models and important Probability Distributions.

5.4.Planning and scheduling

Calendar of sessions: sessions, presentation of papers and exams
Each block would be held in a temporary space of two weeks and a half, until all 15 teaching weeks of the semester. The distribution of the training activities depend on the schedule assigned to the subject, being a possible distribution:
- Block 1st week: 2 hours of lectures and practice of 2 hours in the computer room by group (all groups conducted this week).
- Block 2nd week: 2 hours of lectures and practice of 2 hours in the computer room by group (all groups conducted this week).
- Media Week Block: 1 h of lecture and individual practical assessment of 1 h in computer room per group (all groups conducted in this midweek).
Logically, all the weeks devoted to each block may not coincide with the calendar weeks, due to the emergence of the middle weeks.
The dates and key milestones of the subject are described in detail, along with the other subjects in the first course in the Grade of CTA, on the website of the Faculty of Veterinary Medicine (link: http://veterinaria.unizar.es / gradocta /). This link will be updated at the beginning of each academic year.

5.5.Bibliography and recomended resources

Resources

All information and materials on the subject will be available in updated form in a virtual course that students have access throughout the course
Moreover, most of both theoretical and practical materials are also fully available (both for use as a download) completely open in the portal OCW University of Zaragoza from the following address : http : //ocw.unizar . en / ocw / course / view.php ? id = 15

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