The course aims to provide the students with a thorough understanding of the basis of both Differential and Integral Calculus of functions in several variables, as well as Optimization, which are essential to the several degrees offered at our Faculty. The students will be presented the knowledge in that light of an appropriate balance between the conceptual and practical contents. In other words, learning the bare mechanics will not be enough: a rational use of these tools above mentioned requires an understanding of the conceptual framework that supports them. The goal is therefore that the students grasp an adequate level of familiarity and comprehension of the syllabus. As for the aptitudes, beyond the more specific in relation to the course syllabus (such as understanding the meaning of the notions of partial derivative as well as integral besides knowing how to perform their calculation, etcetera), one may emphasize complementary generic skills. Among them, a meticulous logical reasoning and precise formulation of propositions should not be left unmentioned.

Specific aptitudes of the course:
- To understand and optimally handle the notation and mathematical language.
- To use algebraic expressions correctly.
- To extend the notions acquired in the context of functions of one variable to functions in several variables.
- To get to know the conceptual basis of both Differential and Integral Calculus of real functions in several variables.
- To understand concepts and problems of an economic sphere expressed in mathematical language.
- To pose, solve and analyze optimization problems where functions in several variables play a role.
- To pose, solve and analyze practical exercises involving Differential and Integral Calculus of functions in several variables.

General skills:
- Efficiency in the use basic tools needed in the analysis of economic problems.
- Ability to abstract and analytical thinking.
- Capacity for critical reflection.
- Ability to organize and plan the study itself.
- Ability to communicate orally and in writing using precise language.
- Ability to work independently and in teams.

TEMARIO

1 Differential Calculus
1.1 Fundamental Concepts.
1.2 Real functions in several variables.
1.3 Limits and Continuity (in connection to functions of several variables).
1.4 Differential Calculus (in connection to functions of several variables).
1.5 Functions of a special nature.

2 Optimization in several variables
2.1 Fundamental concepts and general results.
2.2 Optimization without restrictions.
2.3 Optimization with equal restrictions.
2.4 Optimization limited to certain sets.
2.5 Introduction to Linear Programming.

3 Integral Calculus
3.1 Concept if a double integral over bounded areas.
3.2 Properties of double integrals.
3.3 Calculation of double integrals over bounded areas. Theorem of Fubini.
3.4 Calculation of double integrals over unbounded areas.

TIPOS DE DOCENCIA

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Créditos ECTS: 6
The objective is to assess the level of understanding and learning achieved by students. This will be implemented by the organization of two tests and a final exam. The two tests, the first of which will take place when the first chapter has been seen and the second one after chapter 2, will form the fundamental basis of the grade for continuous assessment. The final grade will be based on the best of the following two options: (a) the points which result from applying a 50% weight to the final examination and the other 50% to the continuous assessment tests, and (b) the points which result from applying 100% weight to the final exam.

If a student does not make the final exam, his/her qualification will be No presentado. The final exam will be the same for all the students of all the groups.

These exams will consist of questions meant to evaluate the degree of assimilation of the theoretical content of the syllabus, that is, the knowledge of the techniques studied in the course and the understanding of the basic notions that support them. Therefore, exercises solved with the help of purely mechanical algorithms will not be found in these tests, whereas theoretical questions such as definitions of basic concepts or the statement of important results/propositions will form the core of them.

In the second chance the students will be able to get 100% of the qualification.

BIBLIOGRAFIA

Bibliografía básica

Knuth Sydsaeter and Peter Hammond: Essential Mathematics for Economic Analysis, Prentice Hall.


Bibliografía de profundización

Revistas

Direcciones de internet de interés

www.divulgamat.net