COURSE DATA

DATA SUBJECT

Code: 33122
Name: Mathematics I
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1109 - Degree in Biochemistry and Biomedical Sciences	Facultat de Ciències Biològiques	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1109 - Degree in Biochemistry and Biomedical Sciences	Matemáticas	BASIC

COORDINATION

PEÑAFORT SANCHIS GUILLERMO

SUMMARY

The course "Mathematics I" fits into the basic science education every student of Biochemistry and Biomedical Sciences should acquire before fully entering into the issues specific of the degree.

The subject must, first, fill gaps in mathematical knowledge of many students, who have come to the University without studying mathematics in the second year of high school.

Consistently with this, the course begins with a preamble in which issues such as numbers and vector operations, elementary functions, graphs of functions and their interpretation,... are recalled.

On the other hand, basic math skills should be given for all experimental science: a) the differential and integral calculus necessary to see how math is involved in issues related to speed, slope, the determination of maximum and minimum measurement areas, ..., b) an introduction to differential equations, with more emphasis on the concept and the meaning of the solutions than on the methods of solution, firstly because this is what matters most for a user who is not going to be a professional mathematician and, secondly, because of time constraints, c) an introduction to the methods of numerical calculations, as most of the mathematical problems they will find have no exact solution and we must resort to these methods, using software for it.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

There are no specified restrictions on enrollment with other subjects of the curriculum.

COMPETENCES / LEARNING OUTCOMES

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Aplicar conceptos matemáticos a casos prácticos de índole biológica.

Capacidad de pensamiento lógico-matemático.

Comprender el concepto de derivada y su uso para determinar los intervalos de crecimiento y decrecimiento de una función.

Comprender el concepto de integral de una función y su relación con el área comprendida bajo la misma.

Distinguir las propiedades de los distintos tipos de funciones matemáticas básicas.

Saber calcular las soluciones de las ecuaciones diferenciales más sencillas.

Saber discutir la existencia o no de soluciones de un sistema de ecuaciones lineales y poder calcularlas.

Saber representar gráficamente funciones matemáticas básicas.

Utilización del lenguaje matemático y estadístico.

DESCRIPTION OF CONTENTS

1. - The Basic concepts.
2. - Limits. Continuous functions.
3. - The derivative.
4. - Optimization.
5. - The integral for functions of one variable.
6. - The definite integral.
7. - Ordinary differential equations of first order.
8. - Some differential equations in biology and the environment.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	3,00
Theory	31,00
Computer classroom practice	26,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	0,00
Preparation of lessons	52,00
Preparation for assessment activities	16,00
Resolution of case studies	0,00
Total hours	**68,00**

TEACHING METHODOLOGY

Theoretical classes with non-mandatory attendance.
Practical classes and problem-solving learning concepts using a software in the computer classroom, with compulsory attendance.
Performance of works (based on practical classes) using the computer in order to resolve questions of all parts of the program. Spend regular checks at the seminars provided for this purpose to ensure they are working on the issue and to receive advice on embodiment thereof.

EVALUATION

The evaluation will be implemented through:

- An objective test at the end of the semester, consisting of a test consisting both theoretical-practical questions and problems. The grade in this exam will have 80% of the final grade. To perform this average weighting it is necessary to obtain a minimum score of 4 out of 10 in this test.
- Attendance at practical activities and tutorials is compulsory and a prerequisite to pass the course. (80% attendance to pass the course).
- They require the submission of all proposed work to each student, which will be graded (these may consist of handing-in individual or group work, on-site resolution of exercises/controls or completion of theoretical-practical questionnaires in the virtual classroom). The weight of the grade in the course will be 20% of the final grade. To perform this average weighting it is necessary to obtain a minimum score of 4 out of 10 in the grade of these works.

REFERENCES

BASIC

- J. Stewart: Cálculo: conceptos y contextos, Tercera Edición, International Thomson, México, 1983
- Claudia Neuhauser: "Matemáticas para Ciencias", Ed. Pearson/Prentice Hall, segunda edición, 2009.
- R.Larson, B.H. Edwards: Cálculo 1. Mc Graw Hill 2010.

ADDITIONAL

- D.G. Zill, W.S. Wright: Cálculo de una variable. Mc Graw Hill 2011.
- James Callahan, Kenneth Hoffman, David Cox, Donal O'Shea, Harriet Pollatsek, Lester Senechal : Calculus in Context . The Five College Calculus Project. http://math.smith.edu/Local/cicintro/cicintro.html
- K. Binmore, J. Davies, "Calculus, concepts and methods", Cambridge U. P. 2001
- S. L. Salas, E. Hille."Calculus I y II", I Reverté, Barcelona 1994.
- S. T. Tan: Applied Calculus for the Managerial, Life, and Social Sciences, 5th Edition, Thomson Learning.
- Belmont 2002 G.B. Thomas, R.L. Finney. "Cálculo con Geometría Analítica". Addison-Wesley Iberoamericana, Wilmington 1987.