

Academic Year: ( 2021 / 2022 )

Review date: 28-06-2021

Department assigned to the subject: Department of Mathematics

Coordinating teacher: PESTANA GALVAN, DOMINGO DE GUZMAN

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 1

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Linear Algebra (Course : 1 Semester : 1),  
 Differential Calculus (Course : 1 Semester : 1),  
 Integral Calculus (Course : 1 Semester : 2),  
 Vector Calculus (Course : 1 Semester : 2).

**DESCRIPTION OF CONTENTS: PROGRAMME**

1. Integrals over paths and surfaces
2. Green's, Stokes' and Gauss' theorems
3. Set measure
4. The Lebesgue Integral
5. Monotone and dominated convergence
6.  $L_p$  spaces
7. Parametric integrals
8. Integral transforms: Laplace and Fourier

**LEARNING ACTIVITIES AND METHODOLOGY****LEARNING ACTIVITIES AND METHODOLOGY**

**THEORETICAL-PRACTICAL CLASSES.** [44 hours with 100% classroom instruction, 1.76 ECTS]

Knowledge and concepts students must acquire. Student receive course notes and will have basic reference texts to facilitate following the classes and carrying out follow up work. Students partake in exercises to resolve practical problems and participate in workshops and evaluation tests, all geared towards acquiring the necessary capabilities.

**TUTORING SESSIONS.** [4 hours of tutoring with 100% on-site attendance, 0.16 ECTS]

Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher.

**STUDENT INDIVIDUAL WORK OR GROUP WORK** [98 hours with 0 % on-site, 3.92 ECTS]

**FINAL EXAM.** [4 hours with 100% on site, 0.16 ECTS]

Global assessment of knowledge, skills and capacities acquired throughout the course.

**METHODOLOGIES**

**THEORY CLASS.** Classroom presentations by the teacher with IT and audiovisual support in which the subject's main concepts are developed, while providing material and bibliography to complement student learning.

**PRACTICAL CLASS.** Resolution of practical cases and problems, posed by the teacher, and carried out individually or in a group.

**TUTORING SESSIONS.** Individualized attendance (individual tutoring sessions) or in-group (group tutoring sessions) for students with a teacher as tutor.

## ASSESSMENT SYSTEM

### EVALUATION SYSTEMS

#### SE1 - FINAL EXAM. [50 %]

Global assessment of knowledge, skills and capacities acquired throughout the course.

#### SE2 - CONTINUOUS EVALUATION. [50 %]

Assesses papers, projects, class presentations, debates, exercises, internships and workshops throughout the course.

<b>% end-of-term-examination:</b>	50
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	50

## BASIC BIBLIOGRAPHY

- Folland, G.B. Fourier Analysis and its Applications, Wadsforth & Brooks/Cole, 1992
- Marsden, J.E., Tromba, A.J. Vector Calculus, W.H. Freeman and Company, 2003
- Rudin, W. Real and complex Analysis, Mc Graw-Hill (International Student Edition), 1970

## ADDITIONAL BIBLIOGRAPHY

- Apostol, T.M. Mathematical Analysis, Addison-Wesley, 1974
- Bauer, H. Measure and Integration Theory, Walter De Gruyter, 2001
- Beerends, R.J., ter Morsche, H.G., vanden Berg, J.C., van de Vrie, E.M. Fourier and Laplace Transforms, Cambridge University Press, 2003
- Bogachev, V.I. Measure Theory, Volume I, Springer, 2007
- Gamkrelidze (Ed.) Analysis I (Encyclopaedia of Mathematical Sciences, Volume 13), Springer-Verlag, 1989
- Leadbette, R., Cambanis, S., Pipiras, V. A basic course in measure and probability, Cambridge University Press, 2014
- Pao, K., Soon, F., Marsden, J.E., Tromba, A.J. Vector Calculus (Solved Problems), W.H. Freeman & Co Ltd, 1989
- Pestana, D., Rodriguez, J.M., Marcellán, F. Curso Práctico de Variable compleja y teoría de transformadas, Pearson, 2014