SUBJECT TEACHING GUIDE

G406 - Calculus II

Degree in Electrical Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Degree in Electrical Engineering			Type and Year	Core. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Mathematics Basic Training Module				
Course unit title and code	G406 - Calculus II				
Number of ECTS credits allocated	6	Term		Semester based (2)	
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICA APLICADA Y CIENCIAS DE LA COMPUTACION
Name of lecturer	ANGEL COBO ORTEGA
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Other lecturers	MARTA COLLANTES VIAÑA ELENA MORA VILLAZAN

3.1 LEARNING OUTCOMES
- Calculate double and triple integrals
- Apply change of variables in multiple integrals
- Compute volumen of tridimensional solids using integrals
- Calculate line and surface integrals understanding the physical interpretation of both concepts
- Obtain graphic representations of curves and surfaces using scientific computing software
- Use scientific software to compute different types of integrals
- Use differential equations to model certain physical and engineering problems
- Solve simple first order differential equations, and linear differential equations with constant coefficients
- Use scientific software to compute ordinary differential equations
- Know the basics of partial differential equations, as well as examples of equations that model certain physical problems
- Obtain Fourier and Laplace transforms

4. OBJECTIVES
The goal of the course is to know the basic principles of multiple and vector integration and differential equations , and their practical applications in different engineering problems. The course presents classic methods of integration and scientific software to solve the proposed problems

6. COURSE ORGANIZATION

CONTENTS	
1	MULTIPLE INTEGRALS
1.1	Concept of double integral and calculation methods
1.2	Change of variables in double integrals
1.3	Practical applications of double integrals
1.4	Triple integrals
1.5	Change of variables: cylindrical and spherical coordinates
1.6	Applications of triple integrals
2	LINE AND SURFACE INTEGRALS
2.1	Scalar and vector fields
2.2	Parameterized curves
2.3	Line integral of scalar fields
2.4	Line integral of vector fields
2.5	Conservative fields
2.6	Green's theorem
2.7	Surfaces in space
2.8	Surface integrals of scalar fields
2.9	Surface integrals of vector fields
2.10	Divergence and Stoke's heorems
3	DIFFERENTIAL EQUATIONS AND INTEGRAL TRANSFORMS
3.1	Concept of differential equations and application examples
3.2	Separable differential equations
3.3	First order linear differential equations
3.4	Exact equations and integrating factors
3.5	Linear differential equations with constant coefficients
3.6	Systems of first order linear differential equations
3.7	Introduction to partial differential equations
3.8	Fourier analysis: basic concepts and applications
3.9	Laplace transform
3.10	Application to solve differential equations

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Assessment of the first thematic block	Written exam	No	Yes	20,00
Assessment of the second thematic block	Written exam	No	Yes	20,00
Assessment of the third thematic block	Written exam	No	Yes	20,00
Monitoring activities in class	Others	No	Yes	20,00
Participation in virtual learning platform	Activity evaluation with Virtual Media	No	Yes	20,00
Final exam (for students who have not passed the continuous evaluation)	Written exam	Yes	Yes	0,00
TOTAL				100,00

Observations
The course will have a continuous assessment process
Observations for part-time students
Part-time students will have a different evaluation process based on exams and practical work

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
Materiales en formato electrónico disponibles en el curso virtual de la asignatura