



* Level 1: Tutorial support sessions, materials and exams in this language

* Level 2: Tutorial support sessions, materials, exams and seminars in this language

* Level 3: Tutorial support sessions, materials, exams, seminars and regular lectures in this language

DEGREE: Grado en Ingeniería mecánica (13411002)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
DEGREE: Grado en Ingeniería electrónica industrial (13111002)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
DEGREE: Doble Grado en Ingeniería mecánica e Ingeniería electrónica industrial (13911010)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
DEGREE: Grado en Ingeniería eléctrica (13511002)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
DEGREE: Doble grado en Ingeniería mecánica e Ingeniería de organización industrial (13811002)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
DEGREE: Grado en Ingeniería de organización industrial (13011002)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
DEGREE: Doble grado en Ingeniería eléctrica e Ingeniería mecánica (13611002)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
DEGREE: Doble grado en Ingeniería eléctrica e Ingeniería electrónica industrial (13711002)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
ACADEMIC YEAR: 2021-22

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Advanced Mathematics

CODE: 13411002 (*)

ACADEMIC YEAR: 2021-22

LANGUAGE: English

LEVEL: 1



ECTS CREDITS: 6.0

YEAR: 2

SEMESTER: PC

2. LECTURER BASIC INFORMATION

NAME: GÓMEZ MORENO, SAMUEL

DEPARTMENT: U124 - MATEMÁTICAS

FIELD OF STUDY: 595 - MATEMÁTICA APLICADA

OFFICE NO.: B3 - 006

E-MAIL: samuel@ujaen.es

P: 953 212398

WEBSITE: -

LANGUAGE: English

LEVEL: 1

3. CONTENT DESCRIPTION

CONTENT DESCRIPTION

Topic 1: Introduction. Initial concepts.

Topic 2: Classic partial differential equations. Separation of variables method. Fourier series.

Topic 3: Functions of several variables. Escalar fields. Vectorial fields. Curves and surfaces. Level sets.

Topic 4: Differentiation of multivariate functions. Partial derivatives. Jacobian matrix. Chain rule. Directional derivatives. Nabla operator. Applications.

Topic 5: Multivariate integration. Change of variable. Application.

Topic 6: Line and surface integral for scalar and vectorial fields. Reparameterizations. Applications.

Topic 7: Theorems of Green, Gauss and Stokes. Applications.

Topic 8: Differential geometry of parameterized curves and surfaces.

PRACTICES CONTENT



In the practices classes the software Wolfram Research Mathematica will be used to present and follow the concepts of the items above.

Topic 1: Introduction.

Topic 2: Classic partial differential equations. Fourier series.

Topic 3: Functions of several variables.

Topic 4: Differentiation of multivariate functions.

Topic 5: Multivariate integration.

Topic 6: Line and surface integral for scalar and vectorial fields.

Topic 7: Theorems of Green, Gauss and Stokes.

Topic 8: Differential geometry.

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

45 hours of regular classes in classroom,

15 hours of classes in computer classroom under the supervision of professor.

Students with special educational needs should contact the Student Attention Service (Servicio de Atención y Ayudas al Estudiante) in order to receive the appropriate academic support

5. ASSESSMENT METHODOLOGY

S1) Class attendance and participation in the activities and on-line activities of the course (15%)

Professor will weight student participation in the resolution of the various activities that arise as well as attendance at tutorials. The maximum score in this section is 0.5 points.

The score obtained for item S1 will be kept for all the official examination calls along the course.

S2) Theoretical/practical exam (75%). To pass the subject is compulsory to obtain 40% of the points in this theoretical/practical exam.

The exam will consist of short exercises and / or long problems and it will be rated up to 8 points. To pass the course is necessary to obtain a score equal to or greater than 4 points.

S3) Presentation of additional works and/or exercises (10%). The score obtained for item S3 will be kept for all the official examination calls along the course.



S4) Practices in the computers classroom and new technologies (15%). This item will be evaluated by means of an exam that will be programmed by the professors along the regular period of classes.

Competencies evaluated by S2): CB1, CBB1R, R12

Competencies evaluated by S3): CB1, CBB1R, R12

Competencies evaluated by S4): CB1, CBB1R, R12

6. BOOKLIST

MAIN BOOKLIST:

* Div, grad, curl and all that: an informal text on vector calculus. Edition: 3rd ed. Author: Schey, H. M.. Publisher: Norton and Company

ADDITIONAL BOOKLIST:

* Student solutions manual for mathematical methods for physics and engineering K. F. Riley, M. P. Hobson. Edition: 3rd ed.. Author: Riley, Kenneth Franklin. Publisher: Cambridge University Press,

7. VIRTUAL / CLASSROOM TEACHING SCENARIO

1) TEACHING METHODOLOGY AND ACTIVITIES

Teaching activities	Format (on-site/on-line)	Teaching methodology. Description
A1- Classes of theory for all the group (big group)	On-site/on-line rotary 50% (*)	Half of the grupe will attend the classes on-site as scheduled in the program of the subject and the other half on-line by videoconference with periodic rotation of the students between on-line and on-site as determined by the Faculty and professors.
A2- C lasses in small groups	On-site 100% (*)	On-site classes as scheduled in the program of the subject.

(*) The Faculty could establish a different per cent for the activities depending on the number of students, the capacity of the classrooms and the sanitary measures in force.



2) ASSESMENT SYSTEM

ITEM	CRITERIA	TOOL	WEIGHT
Attendance/ participation (S1)	Active participation in the classroom and tutoring hours both face-to-face and on-line.	Professor's observations and notes	15%
Theory/ Practices exam (S2)	Mastery of the theoretic and practical contents of the subject	Theory/Practices Exam. Face-to-face modality preferably.	75.0%
Works/ exercises (S3)	Delivery of the proposed problems. The professors will consider: development, documentation, originality, correct spelling and presentation.	Proposed work after the practices.	10.0%

3) RESOURCES

For the on-line teaching, computer, tablet or mobile phone with internet connection and Mathematica software installed is required. A document scanning application will be also necessary. Besides, we will make use of the Docencia Virtual system of the University of Jaén as well as the Google tools offered by the University of Jaén. As well, classes video recording software will be used.

Moreover, the bibliographic electronic resources available through the Library of the University of Jaén will be employed.

8. VIRTUAL TEACHING SCENARIO

1) TEACHING METHODOLOGY AND ACTIVITIES

Teaching activities	Format (in-site/on-site)	Teaching methodology. Description
A1- Classes of theory for all the group (big group)	On-site 100%	On-site classes as scheduled in the program of the subject.



A2- C lasses in small groups

On-site 100%

On-site classes as scheduled in the program of the subject.

2) ASSESMENT SYSTEM

ITEM	CRITERIA	TOOL	WEIGHT
Attendance/ participation (S1)	Active participation in the classroom and tutoring hours both face-to-face and on-line.	Professor's observations and notes	15%
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DATA PROTECTION CLAUSE (on line exams)

Institution in charge of data processing: Universidad de Jaén, Campus Las Lagunillas, s/n, 23071 Jaén

Data Protection Delegate: dpo@ujaen.es



Purpose: In accordance with the Universities Law and other national and regional regulations in force, carrying out exams and assessment tests corresponding to the courses students are registered in. In order to avoid frauds while sitting the exam, the exam will be answered using a videoconference system, being able the academic staff of the University of Jaén to compare and contrast the image of the person who is answering the exam with the student's photographic files. Likewise, in order to provide the exam with evidential content for revisions or claims, in accordance with current regulation frameworks, the exam will be recorded and stored.

Legitimacy: compliance with legal obligations (Universities Law) and other national and regional regulations currently in force.

Addressees: service providers who are the owners of the platforms where the exams are carried out and with whom the University of Jaén has signed the corresponding data access contracts.

Storage periods: those established in current in force regulations. In the specific case of exam videoconference recordings, not before the examination records and transcripts are closed or the exam can still be reviewed or challenged.

Rights: you can exercise your right of access, amendment, cancellation, opposition, suppression, limitation and portability by sending a letter to the postal or electronic address indicated above. In the event that you consider that your rights have been violated, you may submit a complaint to the Andalusian Council for Transparency and Data Protection www.ctpdandalucia.es

CLASS RECORDING CLAUSE PERSONAL DATA PROTECTION

Person in charge: Universidad de Jaén, Paraje Las Lagunillas, s/n; Tel.953 212121; www.ujaen.es

Data protection delegate (DPO): TELEFÓNICA, S.A.U. ; Email: dpo@ujaen.es

Procedure aim: To manage proper recordings of teaching sessions with the aim of facilitating learning process under a multimodal and/or online teaching

Period for record storage: Images will be kept during legal term according to regulations in force

Legitimacy: Data will be managed according to legal regulations (Organic Law 6/2001, December 21, on Universities) and given consent provided by selecting corresponding box in legal admission documents

Data recipients (transfers or assignments): Any person allowed to get access to every teaching modality

Rights: You may exercise your rights of access, rectification, cancellation, portability, limitation of processing, deletion or, where appropriate, opposition. To exercise these rights, you must submit a written request to the Information, Registration and Electronic Administration Service of the University of Jaen at the address above, or by e-mail to the address above. You must specify which of these rights you are requesting to be satisfied and, at the same time, you must attach a photocopy of your ID card or equivalent identification document. In case you act through a representative, legal or voluntary, you must also provide a document that proves this representation and identification. Likewise, if you consider that your right to personal data protection has been violated, you may file a complaint with the Andalusian Data Protection and Transparency Council www.ctpdandalucia.es