GUÍAS DOCENTES

Universidad de Jaén

School of Engineering of Linares

Intelligent transportation systems

2024-2025

Máster Universitario en Ingeniería del transporte terrestre y logística

Acceso Mayores 40
Guías docentes UJA
Horarios de tutorías
Llamamientos PAU
Movilidad (Coordinador)
P.O.D.
Solicitud bilingüismo

Syllabus 2024-25 - 73012003 - Intelligent Transportation Systems (Sistemas inteligentes del transporte)

Caption
- 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

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DEGREE: Máster en Ingeniería del transporte terrestre y logística
FACULTY: SCHOOL OF ENGINEERING OF LINARES
ACADEMIC YEAR: 2024-25
COURSE: Intelligent Transportation Systems

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Intelligent Transportation Systems
CODE: 73012003 ACADEMIC YEAR: 2024-25
LANGUAGE: English LEVEL: 2
ECTS CREDITS: 4.0 YEAR: 1 SEMESTER: PC

2. LECTURER BASIC INFORMATION

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3. CONTENT DESCRIPTION

Introduction to intelligent systems

- Fuzzy sets theory
- Fuzzy Linguistic Approach. Introduction
- Representation models
- Definitions and Operations
- Computing models
- Intelligent Systems for Decision Making

Introduction to Decision Making Problems
Classification of Decision Making Problems
Modeling preferences
Problem Solving Methods of Decision Making Problems
Intelligent Systems Support Decision Making

Evolutionary and bio-inspired computation

- Genetic Algorithms
- Particle Swarm Optimization
- Soft Computing Hybridizations
- Genetic-Fuzzy Systems
- Last trend

Apart from this, it is important to highlight that the student will be provided with the ability to be updated with the latest developments in science and technology due to the dynamic environment.

Practical applications in transportation I

- Advanced Systems Urban Traffic Management.
- Management Systems ofCritical Infrastructure Highway (tunnels, bridges ...)
- Tolls Management Systems
- Management Systems Ticketing in public transport
- Advanced Traveler Information Systems Mobility

Practical applications in transportation II

- Transport management systems and displacements
- Management systems travel demand
- Operation of commercial vehicles
- Emergency management systems
- Advanced control systems and vehicle safety
- ITS applications for private vehicles, public transport and commercial vehicles.

In addition, communication skills, ideas, problems and solutions in the field of engineering and society in general will be developed through documentation delivery processes or oral presentations.With regard to the organization of work, collaboration and teamwork will be encouraged through the design of the practices.

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

The development of large groups and small groups lectures will be focused on promoting quality teaching by giving priority to activities that foster inclusive and equitable learning (SDG-4).

The lectures in a large group consist of the following activities:

-Introductory activities.

-Master Session.

-Conferences

Besides the exposition the theoretical contents of the subject, the ability to collect and interpret data and manage complex concepts within the subject will be developed and enhanced, in order to make judgments that imply reflection on ethical and social issues.

lecturess in practice groups:

-Laboratories.

-Seminars.

-Debates.

-Resolution of exercises.

-Presentations/ exhibitions

in addition, work in a collaborative environment will be encouraged, as well as mixing with the communication of results, with special emphasis on the need for ongoing training in activities related to telecommunications throughout their independent professional life.

Collective/individual tutorials:

The collective tutorials will be used in the resolution of doubts, follow-up and supervision of the works and exercises, as well as in the assistance and participation in the different seminars planned in the subject, in addition to talks, conferences, workshops and/or conferences, designated bythe teacher, in order to complete and update the training and obtain general, transversal and/or specific skills defined for this activity, such as the value of continuous training, entrepreneurship or the review of technological developments in the field.

Attendance, as well as active, respectful and responsible participation in the aforementioned activities, will be evaluated according to the provisions of the evaluation system of this guide.

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

The student evaluation will be made by a final exam and continuous evaluation during the course, as follows:

- Final exam on the theoretical content, seminars and of the activities exposed (50%).
- Attendance and participationin the theoretical sessions, seminars andexhibitionactivitieswill be assessed (15%).
- Work through technical reports, computer practices and other work will be assessed (35 %).

With this systems the following competences will be evaluated: TR1, TR2,TR3, TR4, TR5, TR6, E2, E8, E9, E12 , CB6, CB7,CB8, CB9, CB10

The positive evaluation of the entire evaluation system will mean that the student has achieved the following learning outcomes: R1, R2, R3, R4, R5

6. BOOKLIST (Access the bibliography in the Library catalog)

MAIN BOOKLIST:

- Swarm intelligence. Edition: -. Author: Kennedy, James. Publisher: San Francisco: Morgan Kaufmann, 2001 (Library)
- Fuzzy sets and fuzzy logic: theory and Applications. Edition: -. Author: Klir, George J.. Publisher: Upper Saddle River: Prentice Hall, 1995 (Library)
- Analysis and decision making in uncertain systems. Edition: -. Author: Bubnicki, Zdzislaw. Publisher: London: Springer, 2004 (Library)
- Genetic fuzzy systems: evolutionary tuning and learning of fuzzy knowledge bases. Edition: -. Author: -. Publisher: Singapore [etc.] : World Scientific , cop. 2001 (Library)

ADDITIONAL BOOKLIST:

- Fuzzy multicriteria decision-making : models, methods and applications . Edition: -. Author: Pedrycz, Witold. Publisher: Chichester, West Sussex, U.K. : Wiley, 2011 (Library)

7. SUSTAINABLE DEVELOPMENT GOALS

Educación de calidad

DETAILED INFORMATION

SDG-04. Quality Education

Throughout all the activities of the course, fundamental aspects related to inclusion and equity will be addressed, which will also be part of the evaluation of the aspects of participation. Thus, it will be promoted, both in the expository classes in large groups, as well as in small groups, the use of inclusive language both at written and oral level and attending to activities of various kinds focused on being equitable with the different learning abilities of the student.

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

Teaching methodology and learninig activities

Learning activities	Format	Teaching methodology Description
A1. Lectures with big group of students	100% in person class	Participatory master class sessions, lasting one or two hours each, held in the classroom.
A2. Lectures with practical groups	100% in person class	Development of practical sessions, lasting two hours each, in laboratories.
Group tutorials	In person or online	The tutoring sessions, both group and individual, will be carried out preferably online (synchronous and / or asynchronous). The face-to-face tutoring sessions will be agreed between the person responsible for the subject / group and the students.

Schedule

The schedule can vary mainly due to the change from multi-modal scenario to the online one.

Evaluation System

There are no changes in the evaluation format (weights of each section) or in what is specified in the detailed evaluation.

Resources

Given that the attendance in the large group lectures and in the classes in practice groups is 100%, no exceptional resources are foreseen for them.

9. VIRTUAL TEACHING SCENARIO

Teaching Methodology and Learning Activities

Learning activities	Format	Teaching methodology Description
A1. Lectures with big group of students . - Synchronous classes by videoconference. - Asynchronous classes based on videos and / or audiovisual content, forums, interactive material, etc.	Online	The sessions of participative face-to-face classes, of one or two hours each, are replaced by other activities carried out through the Internet such as:- - Classes by videoconference or in virtual classroom - Visualization of videos with explanation of the theoretical contents. - Review of interactive material on the subject. - Review of content on the Internet (forums, - specialized websites)
A2. Lectures with practical groups	Online	Practical sessions are replaced by online training activities, of two hours each, by other activities carried out through the Internet such as: - Virtualized or simulation activities. - Visualization of videos with explanation of the practical contents. - Review of interactive material about practices. - Online content review (forums, specialized websites, etc.)

Schedule

The schedule can vary mainly due to the change from multi-modal scenario to the online one.

Evaluation System

There are no changes in the evaluation format (weights of each section) or in what is specified in the detailed evaluation. The final exam will be done synchronously online .

Resources

Since all the teaching, either in the exposition classes in large groups or in the classes in practice groups, be taught online, the following resources will need to be used:

Common telematic resources (teachers and students):

- PC equipment or similar.

- Videoconference system or virtual classroom, such as Google Meet or BigBlueButton.

- Use of interactive tools: screen sharing to use comments as a virtual whiteboard in PDF presentations.

- Use of the teaching platform of the University of Jaén: messaging, forums, tasks, activities and means of evaluation.

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