Escuela Técnica Superior de Ingeniería

GENERAL SPECIFICATIONS

ETSI
ESCUELA TÉCNICA
SUPERIOR DE INGENIERÍA
uhu.es

COURSE 22/23

Subject Data

Name:

Representación del Conocimiento

English name:

Knowledge representation

Code:	Type:
606010236	Mandatory

Hours:

	Total	In class	Out class
Time distribution	150	60	90

ECTS:

Standard group	Small groups			
	Classroom	Lab	Practices	Computer classroom
3		0	0	3

Departments:	Knowledge areas:
Information Technology	Computer Science and Artificial Intelligence

Year:	Semester
3°	2°

TEACHING STAFF

Name:	E-mail:	Telephone
Carpio Cañada, Jose	jose.carpio@dti.uhu.es	959217658

Others Data (Tutoring, schedule...)

You can find me at my office located at University of Huelva Engineering School, office number 145, Campus del Carmen, 21007 Huelva.

Please consult my Tutoring timetable for each semester.

SPECIFIC INFORMATION OF THE COURSE

1. Contents description:

1.1 In English:

Being able to represent information in an appropriate way is essential to solve a multitude of problems.
Logical programming as a method of representing knowledge is a challenge for computer science
students. Logical programming, as a paradigm different from imperative programming, requires an
additional effort on the part of the student. This process of understanding this method of representing knowledge will take
us the greater part of the study of this subject, because a new paradigm of
programming can not be understood until after a long period of practice.
Topic 1. Introduction
Topic 2: First order logic.
Topic 3: Rules to represent knowledge.
UNIT 4: Vagueness and Uncertainty.
Topic 5. Representation of actions and planning

1.2 In Spanish:

Ser capaz de representar la información de manera apropiada es esencial para resolver una multitud de
problemas. La programación lógica como un método para representar el conocimiento es un desafío para
los estudiantes de informática. La programación lógica, como un paradigma diferente de la programación
imperativa, requiere un esfuerzo adicional por parte del estudiante. Este proceso de comprensión en este
método de representar el conocimiento nos llevará a la mayor parte del estudio de este tema, porque un
nuevo paradigma de programación no puede ser comprendido hasta después de un largo período de
práctica.
Tema 1. Introducción
Tema 2: Lógica de primer orden.
Tema 3: Reglas para representar conocimiento.
Tema 4: Vaguedad e Incertidumbre.
Tema 5. Representación de acciones y planificación.

2. Background:

2.1 Situation within the Degree:

Being able to represent information in an appropriate way is essential to solve a multitude of problems.
This subject is related to those others that need to handle information such as those related to
Artificial Intelligence, Databases or Software Engineering.

2.2 Recommendations

ANEXO I

Be familiar with the basic concepts of data structures and algorithm design techniques and analysis.

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3. Objectives (as result of teaching):

 - Represent knowledge symbolically in a form suitable for automated reasoning, and methods
associates of reasoning.
- Combine formal algorithmic analysis with a description of the most recent applications.
- Acquire basic knowledge about computational logic.
- Acquire programming knowledge in Prolog.

4. Skills to be acquired

4.1 Specific Skills:

 CE5-C: Ability to acquire, obtain, formalize and represent human knowledge in a computable form
for the resolution of problems through a computer system in any field of application, particularly those
related to aspects of computing, perception and performance in intelligent environments or environments.

4.2 General, Basic or Transversal Skills:

CB4: That the students can transmit information, ideas, problems and solutions to an audience as much
specialized as non-specialized
CG0: Capacity for analysis and synthesis: Finding, analyzing, criticizing (critical reasoning), relating,
structuring and
synthesize information from various sources, as well as integrate ideas and knowledge.
G03: Ability to solve problems
G04: Ability to make decisions based on objective criteria (experimental, scientific or simulation data)
available) as well as the ability to logically argue and justify said decisions, knowing how to accept others
points of view
G06: Capacity for autonomous learning as well as initiative and entrepreneurial spirit
G07: Motivation for quality and continuous improvement, acting with rigor, responsibility and professional
ethics.
G08: Ability to adapt to technologies and future environments updating professional skills.
G09: Ability to innovate and generate new ideas.
CT2: Development of a critical attitude in relation to the capacity of analysis and synthesis.
CT3: Development of an attitude of inquiry that allows the revision and permanent advancement of
knowledge.
CT4: Ability to use Computer and Information Competencies (CI2) in professional practice.

5. Training Activities and Teaching Methods

5.1 Training Activities:

- Theory sessions on the contents of the Program.
- Problem Solving sessions.
- Practical sessions in specialized laboratories or computer rooms.
- Activities Academically Directed by the Faculty: seminars, conferences, development
of works, debates,
- collective tutorials, evaluation activities and self-evaluation

5.2 Teaching Methods::

- Participatory Master Class.
- Development of Practices in Specialized Laboratories or Computer Classrooms in small groups.
- Problem solving and practical exercises.
- Individual or Collective Tutorials. Direct interaction teachers-students.
- Approach, Realization, Tutoring and Presentation of Works.
- Conferences and Seminars.
- Evaluations and Exams.

5.3 Development and Justification:

To develop the skills to acquire in this subject will be used the following groups of teaching activities
formative: - Theoretical / practical classes and problems: 70% - Laboratory / computer practices: 25% -
AAD (Collective tutorials,
cross-cutting activities ...): 5%

6. Detailed Contents

Topic 1. Introduction
1.1 Basic concepts.
1.2 Systems based on knowledge.
1.3 Reasoning.
Topic 2: Introduction to logic programming with Prolog.
Topic 3: Knowledge representation techniques with logical programming and lists.
Topic 4: Knowledge representation techniques with logical programming and trees.
Topic 5: Knowledge representation techniques with logical programming and graphs.
Topic 6: Other knowledge representation techniques.

7. Bibliography

7.1 Basic Bibliography:

-    Programación declarativa. Manual para la docencia [95]. José Carpio Cañada, Gonzalo Antonio Aranda Corral, José, Marco de la Rosa. Servicio de Publicaciones, Universidad de Huelva, 2010
-    Prolog Programming for Artificial Intelligence, Ivan Bratko, Addison Wesley; 3rd edition (2000)
-    Representación del conocimiento en sistemas inteligentes, Gregorio Fernández Fernández
     http://www.gsi.dit.upm.es/~gfer/ssii/rcsi/

7.2 Additional Bibliography:

ANEXO I

- Knowledge Representation and Reasoning, Ron Brachman and Hector Levesque
http://www.sciencedirect.com/science/book/9781558609327

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8. Systems and Assessment Criteria

8.1 System for Assessment:

- Theory / problems exam
- Defense of Written Works and Reports
- Exam of practices

8.2 Assessment Criteria and Marks:

8.2.1 Examinations Convocatory I

The single final evaluation will consist, for all calls, of a single academic act that
will be made up of
the following tests:
Test 1: Written exam on the contents explained in the theory sessions and
problems. will have a character
face-to-face and individual, with a maximum duration of up to 2.5 hours.
Test 2: Practical exam in which problems to be solved will be presented.
To pass the subject you have to pass with more than 5.0 regardless of both
tests.
When the number of students who choose to be evaluated with Honors exceeds the
number of possibilities, it will be discriminated taking into account the following requirements, in the order
Indicated: In the first place, the students will be ordered according to the final grade in the minutes. if it continues
fairness, they will be ordered only by the note of the theoretical part. If equity continues
will hold a raffle.

8.2.2 Examinations Convocatory II

The single final evaluation will consist, for all calls, of a single academic act that
will be made up of
the following tests:
Test 1: Written exam on the contents explained in the theory sessions and
problems. will have a character
face-to-face and individual, with a maximum duration of up to 2.5 hours.
Test 2: Practical exam in which problems to be solved will be presented.
To pass the subject you have to pass with more than 5.0 regardless of both
tests.
When the number of students who choose to be evaluated with Honors exceeds the
number of possibilities, it will be discriminated taking into account the following requirements, in the order
Indicated: In the first place, the students will be ordered according to the final grade in the minutes. if it continues
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8.2.3 Examinations Convocatory III

ANEXO I

The single final evaluation will consist, for all calls, of a single academic act that will be made up of
the following tests:
Test 1: Written exam on the contents explained in the theory sessions and problems. will have a character
face-to-face and individual, with a maximum duration of up to 2.5 hours.
Test 2: Practical exam in which problems to be solved will be presented.
To pass the subject you have to pass with more than 5.0 regardless of both tests.
When the number of students who choose to be evaluated with Honors exceeds the
number of possibilities, it will be discriminated taking into account the following requirements, in the order
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fairness, they will be ordered only by the note of the theoretical part. If equity continues
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ANEXO I

8.2.4 Extraordinary Convocatory

The single final evaluation will consist, for all calls, of a single academic act that
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the following tests:
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face-to-face and individual, with a maximum duration of up to 2.5 hours.
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When the number of students who choose to be evaluated with Honors exceeds the
number of possibilities, it will be discriminated taking into account the following requirements, in the order
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fairness, they will be ordered only by the note of the theoretical part. If equity continues
will hold a raffle.

8.3 Single Final Evaluation:

The single final evaluation will consist, for all calls, of a single academic act that
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the following tests:
Test 1: Written exam on the contents explained in the theory sessions and
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Test 2: Practical exam in which problems to be solved will be presented.
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fairness, they will be ordered only by the note of the theoretical part. If equity continues
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