

**Artificial Intelligence and Health**

Code: 105017  
ECTS Credits: 3

| Degree           | Type | Year | Semester |
|------------------|------|------|----------|
| 2502442 Medicine | OT   | 3    | 1        |
| 2502442 Medicine | OT   | 4    | 0        |
| 2502442 Medicine | OT   | 5    | 0        |
| 2502442 Medicine | OT   | 6    | 0        |

**Contact**

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**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: No

**Teachers**

Manel Cremades Pérez  
Francisco García Cuyas  
Jordi Tarasco Palomares

**External teachers**

MARC ANTONI BROGGI TRIAS

**Prerequisites**

It is advisable that the student has obtained the basic competences of the first and second year subjects, especially those related to epidemiology and preventive medicine.

It is recommended that the student be familiar with the use of new technologies.

The student must have basic knowledge of Spanish and/or Catalan, so the main part of the lectures are in those languages. English will be required to navigate and understand the information contained in the databases and audiovisual material in internet.

**Objectives and Contextualisation**

- To know the basics - methodological and scientific bases - of digital health and the new technologies applied to the Smart Health.
- To know the main fields of contemporary digital health development.

- Acquire competence with basic technologies based on their theoretical foundations and indications, using clinical models as facilitators of learning.
- Students will be introduced to the concepts and basic tools of Artificial Intelligence focused on their future professional practice. Sessions will aim to familiarize students with the use of the most used tools and online resources.
- Introduce the student in the ethical considerations in the use of massive data and Artificial Intelligence.

## Competences

### Medicine

- Be able to work in an international context.
- Demonstrate basic research skills.
- Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
- Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
- Use information and communication technologies in professional practice.

## Learning Outcomes

1. Be able to work in an international context.
2. Demonstrate basic research skills.
3. Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
4. Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
5. Use information and communication technologies in professional practice.

## Content

SUBJECT 1 - Introduction to artificial intelligence and automatic learning.

SUBJECT 2 - Evidence-based medicine and surgery. Linguistic normalization. Search engines.

SUBJECT 3 - Smart city environment. Smart Health. Liquid Hospital. The role of the doctor in a Smart Health environment.

SUBJECT 4 - Biometrics of the environment and Big Data. Internet of Things. Apps and Telemetry.

SUBJECT 5- Neuromorphic computation. Deep learning. Supervised and unsupervised predictive models.

SUBJECT 6- The global medical brain.

SUBJECT 7- Robotics applied to the healthcare field.

SUBJECT 8 - Bioethics of Automatic Learning. Algorithmic ethics.

## Methodology

The orientation of the subject is informative and aims to stimulate the student to do research in the field of the new technologies.

Learning in many cases involves the introduction and use of the main facilities offered by the web applications and the selected software.

The student will have to work on the field and perform a powerpoint presentation on one of the subjects treated in class and their application to the medical assistance environment.

In the current exceptional circumstances, at the discretion of the teachers and also depending on the resources available and the public health situation, some of the theoretical classes, practicals and seminars organized by the Teaching Units may be taught either in person or virtually.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

| Title                         | Hours | ECTS | Learning Outcomes |
|-------------------------------|-------|------|-------------------|
| Type: Directed                |       |      |                   |
| PRACTICAL SESSIONS (SEMINARS) | 7     | 0.28 | 2, 3, 4, 1        |
| THEORY                        | 8     | 0.32 | 2, 5              |
| Type: Supervised              |       |      |                   |
| TUTORIALS                     | 10    | 0.4  | 2, 3, 4, 1        |
| Type: Autonomous              |       |      |                   |
| FIELD RESEARCH                | 5     | 0.2  | 2, 3, 1, 5        |
| ORAL PRESENTATION             | 5     | 0.2  | 2, 3, 4, 5        |

## Assessment

The consolidation of what has been learned in the subject will be through a powerpoint presentation on some of the topics discussed, which will be defended in class with the rest of the classmates.

The competencies of the subject will be through continuous assessment, along with the attendance (40% of the note), the tutoring (20%) and the oral presentation (40% of the note).

The minimum qualification required to pass the subject is 5 points.

Students who have not passed the subject through continuous evaluation may do additional work as a recovery assessment.

## Assessment Activities

| Title                                          | Weighting | Hours | ECTS | Learning Outcomes |
|------------------------------------------------|-----------|-------|------|-------------------|
| Assistance and active participation in classes | 40%       | 15    | 0.6  | 3, 4, 1           |
| Oral presentation                              | 40%       | 10    | 0.4  | 2, 3, 4, 1, 5     |
| Tutorials                                      | 20%       | 15    | 0.6  | 2, 3, 4           |

## Bibliography

<https://www.ncbi.nlm.nih.gov/>

<https://es.coursera.org/instructor/andrewng>

<https://su.org/>

<https://ai.google/>

<https://aws.amazon.com/es/>

<http://ai.stanford.edu/>

## **Software**

There is no specific software