

Asignatura Optativa de GRADO (CURSO 2023-2024)

SUBJECT Name : Technology and Innovation applied to health, nutrition and sport.

Code:

Subject (carácter): Elective

Responsible center: Faculty of Nursing, Physiotherapy and Podiatry

Credits: 3

Number of places offered: 30

	Total (32%)	Teoría	Seminars	Laboratories
Presentials Hours	24	10	4	10

Proposed calendar and schedule (semester/ day/ schedule): 2 semester. Tuesday from 1:30 p.m. to 2:30 p.m. Theoretical classes; Practical classes: Tuesday and/or Thursday morning and/or afternoon and Friday morning, depending on the availability of the Exercise Physiology Laboratory, School of Sports Medicine. Classroom I of the School of Sports Medicine (Faculty of Medicine, Pavilion VI – 5th Floor)

STUDENT PROFILE (University degrees for which they are offered, if applicable)

3rd year degree students in nursing; They will also be able to opt for other degrees such as Physiotherapy and Podiatry

BRIEF DESCRIPTOR

Technological development applied to health has undergone a spectacular boom in the 21st century, both due to the rise of digital knowledge and the development of technology.

The future of medicine is increasingly destined to be understood with technology. Tech companies know this, and are making efforts to create health-related solutions. Patients are increasingly open to the use of technology to improve their lives and companies take advantage of this fact as a source of economic growth. In recent years we are seeing launches of wearables and apps aimed at measuring and diagnosing aspects related to people's health.

5G communication, artificial intelligence, big data or supercomputing are transforming healthcare systems. These technologies will allow us in the future to make diagnoses faster, more effective and with fewer side effects.

There are more and more companies dedicated to technological development in the health field, but it is necessary to know what the limitations of the treatment of patient data are, and with what security guarantees it is necessary to work with them.

The development of technology applied to health also requires the integration of activities such as research, analysis, synthesis and dissemination of the results of the evaluation and verification of their applicability.

OBJECTIVES

- A) Emphasize the interdependence of knowledge, emphasizing the connection between research, development, practical application and development of health technology.
- B) Achieve increased operational capacity at all levels for the development of the application of technology in the medical field.
- C) Recognize and value the contributions of the guidelines of good clinical practice in the achievement of previous medical studies for the development of technologies applied to the health field.
- D) Appreciate the importance of scientific training to adopt a critical attitude about the problems that arise about technology applied to health.
- E) Value scientific knowledge as a process of continuous change that adapts to the needs of new technologies applied to health.

ACADEMIC SKILLS

Degree Competences

General Competences

CG.1.1 hasta CG 1.4, CG 2.2, CG2.3, CG4.1, CG4.2, CG4.4, CG 4.5, CG 8.1

Specific Competences

CE.M 4.1 hasta 4.12, CE.M 4.17, CME 4.22 y CME 4.23

LEARNING OUTCOMES

Provide knowledge about technology and its use in the health area and obtain skills in the field of technological entrepreneurship

TEACHING ACTIVITIES (theoretical, practical, seminars, workshops, etc.)

1.- Theoretical classes

20 theoretical hours of development of the proposed syllabus.

2.- Practical classes:

8 practical hours in the Effort Physiology laboratory of the School of Medicine of Physical Education and Sports. 2 Hours of presentation of technological proposals applicable to health by each working group.

3.-Tutorials:

Those corresponding to each of the teachers with the schedules they have for tutorials

CONTENT TOPICS

Topic 1. The influence of technology and innovation in health. History of its development.

Topic 2. Applicability of technology to health care. Myths and realities. The health technology business market and its future evolution.

Topic 3. Technology Applied to Sport (1): Apps, Apps for health, sport and nutrition

Topic 4. Technology applied to sport (2): Wearables; application for registering biomedical variables.

Topic 5. Technology applied to sports (3): Other medical devices for recording biomedical variables used in health, sports and nutrition.

Topic 6. How should research and clinical trials with humans be. Biobanks. Data collection notebooks. Monitoring of clinical trials. Use of biological samples of human origin for research purposes.

Topic 7. Ethical and legal aspects in the development of clinical trials with medical technology. Ethics committees, where to request authorizations. Informed consent models for clinical trials in healthy individuals and patients.

Topic 8. Treatment of biomedical data, data hosting and security regulations according to the law. Statistical treatment of biomedical data.

Topic 9. How is the Protection of the results of R&D&i. Patents, Utility Models and Trademarks.

Topic 10. ETBS, Start-up; How is the creation of a technology-based company

Item 11. Future of technology applied to health, repercussions on patient care. Artificial intelligence and its usefulness in patient care.

EVALUATION

a) Multiple choice test of 30 questions on the theoretical and practical content of the subject (multiple answers and no negatives). The exam represents **40% of the evaluation**.

b) Presentation, the presentation represents **40% of the evaluation**.

c) Practices and class attendance: these represent **20% of the evaluation**. Attendance to both classes and practices is controlled by signature on the card.

BIBLIOGRAPHY - INTERNET Resources

Bibliography:

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3. Ash, J. S., Berg, M., & Coiera, E. (2004). Some unintended consequences of information technology in health care: the nature of patient care information system-related errors. *Journal of the American Medical Informatics Association*, 11(2), 104-112.
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7. Tamura, T., Maeda, Y., Sekine, M., & Huang, M. (2017). The Role of Wearable Monitor for Healthcare. *Advances in Science & Technology*, 100.
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TEACHER* (It must be indicated if the teaching staff has already completed all their teaching dedication or not)

Responsible teacher (coordinator):

Name: Pilar Martín Escudero (pmartinescudero@med.ucm.es)

Department: Radiology, Rehabilitation and Physiotherapy Department

Other teachers:

1.- Name: Dr. Francisco Miguel Tobal (miguelto@ucm.es);

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2.- Name: Mr. Pablo Cuesta (pablo.cuesta@ucm.es)

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3.- Mr. Ricardo Bruña (ricardo.bruna@ucm.es)

Department: Radiology, Rehabilitation and Physiotherapy Department

4.- Dra. Elena Jimenez Herranz (mariaelj@ucm.es)

Departamento: Departamento Radiología, Rehabilitación y Fisioterapia

GUEST PROFESSOR/S:

1.- Professors of the Polytechnic University of Madrid (Biomedical Engineering)

2- Professors of the Master of Medical Physics of the UCM