

Course guide

240329 - 240NR015 - M-Health Systems

Last modified: 08/07/2026

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.

Degree: MASTER'S DEGREE IN NEUROENGINEERING AND REHABILITATION (Syllabus 2020). (Compulsory subject).
MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2025). (Optional subject).

Academic year: 2026 **ECTS Credits:** 4.5 **Languages:** English

LECTURER

Coordinating lecturer: JUAN JOSE RAMOS CASTRO

Others:

TEACHING METHODOLOGY

Participatory class
Project-based learning

LEARNING OBJECTIVES OF THE SUBJECT

To introduce the student in the de telemedicine systems for ambulatory or mobile applications. The goal is that the student learns the general structure of m-Health systems, their applications and limitations (technical and legal). In order to carry out this learning the student will have to analyze a practical case, identify the needs and propose a solution based on a telemedicine system.

STUDY LOAD

Type	Hours	Percentage
Self study	72,0	64.00
Hours large group	40,5	36.00

Total learning time: 112.5 h

CONTENTS

Introduction to m-Health systems

Description:

This introductory session explores the fundamentals, evolution, and core components of mobile health (m-Health) systems with practical examples.

Full-or-part-time: 4h

Theory classes: 2h

Self study : 2h

m-Health sensors

Description:

Health and well-being sensors
Diagnostic sensors
Assistive sensors
Prognostic sensors

Full-or-part-time: 4h

Theory classes: 2h
Self study : 2h

m-Health and mobile communication systems

Description:

-Wireless data transmission
EM wave propagation
Modulation
Mobile Networks and Wireless Technologies for m-Health
IoT and M2M Communications for Healthcare

Full-or-part-time: 8h

Theory classes: 4h
Self study : 4h

Regulatory aspects of m-health systems

Description:

Telemedicine in EU
Legal aspects
Data protection

Full-or-part-time: 4h

Theory classes: 2h
Self study : 2h

The future of m-Health care systems

Description:

content english

Full-or-part-time: 2h

Theory classes: 1h
Self study : 1h

GRADING SYSTEM

25% Continuous grading (project results)
50% Project grading (35% team work, 15% peer evaluation)
25% Final exam

BIBLIOGRAPHY

Basic:

- Istepanian, Robert S.H. ; Bryan Woodward. M-health : fundamentals and applications [on line]. Hoboken, New Jersey: John Wiley & Sons, 2017 [Consultation: 08/07/2026]. Available on: <https://onlinelibrary-wiley-com.recursos.biblioteca.upc.edu/doi/book/10.1002/9781119302889>. ISBN 9781119302902.

Complementary:

- Prutchi, David ; Norris, Michael. Design and development of medical electronic instrumentation : a practical perspective of the design, construction, and test of medical devices [on line]. Hoboken, 2005 [Consultation: 08/07/2026]. Available on: <https://onlinelibrary-wiley-com.recursos.biblioteca.upc.edu/doi/book/10.1002/0471681849>. ISBN 0471676233.
- Fries, Richard C.. Reliable design of medical devices. 3rd Edition. Boca Raton: CRC, 2013. ISBN 9781138075191.
- Ogrodnik, Peter J.. Medical device design : innovation from concept to market. 3rd ed. London: Academic Press, 2026. ISBN 9780443403187.
- Telemedicine Technology and Applications. PRENTICE HALL, 2017. ISBN 9788120353039.
- Giuseppe Andreoni, Paolo Perego, Enrico Frumento. m-Health Current and Future Applications. Springer International Publishing, 2019. ISBN 978-3030021825.

RESOURCES

Audiovisual material:

- Nom recurs. Resource