



## INSTITUTO DE FÍSICA

### FACULTAD DE FÍSICA

COURSE	:	<b>PHYSICS OF MEDICAL IMAGING</b>
TRANSLATION	:	FÍSICA DE LAS IMÁGENES MÉDICAS
NUMBER	:	FMD3005
CREDITS	:	10 UC / 6 SCT
MODULES	:	2
REQUISITES	:	FMD3002
CONECTOR	:	AND
RESTRICTIONS	:	030401, 030501, 030801, 030802, 030803
CHARACTER	:	MINIMUM (for curriculum 030801, 030802, 030803)
FORMAT	:	THEORETICAL LECTURES
QUALIFICATION	:	STANDARD
FORMATIVE LEVEL	:	MAGISTER
DISCIPLINE	:	PHYSICS

#### I. COURSE DESCRIPTION

This course deals with the physical foundations of the generation of the most used medical images today and with the current research challenges of this area.

#### II. LEARNING OUTCOMES

- Describe the physical basis of the generation of the most relevant medical imaging techniques.
- Compare and evaluate the different studied imaging techniques according to current clinical needs.
- Present current research in the area of medical imaging.

#### III. CONTENT

- Generation of x rays in radio diagnostics.
- The radiographic image.
- Radiography.
- Mammography.
- Fluoroscopy.
- Computer tomography.
- Nuclear medicine: PET and SPECT.
- Ultrasound imaging.
- MRI
- Quality control of medical images.
- Biological effects associated with medical imaging techniques.
- Medical images for radiotherapy.

#### IV. METHODOLOGICAL STRATEGIES

- Lectures,
- Flipped classes,
- Personal research and field visits.

#### V. EVALUATIVE STRATEGIES

- Two written tests (60%)
- Oral presentation (30%)



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**VI. BIBLIOGRAPHY**

**REQUIRED**

- J.T. Bushberg, J.A. Seibert, E.M Leidholdt, Jr., J.M. Boone. The Essential Physics of Medical Imaging, 3rd ed. (Lippincott Williams and Wilkins, Philadelphia, PA, 2012).
- S. C. Bushong. Radiologic Science for Technologists: Physics, Biology and Protection, 10<sup>th</sup> ed. (Elsevier, St. Louis, Missouri, 2013).
- P. Suetens. Fundamentals of Medical Imaging, 2<sup>nd</sup> ed. (Cambridge University Press, New York, 2009).
- P.P. Dendy and B. Heaton. Physics of Diagnostic Radiology. (CRC Press, London, UK, 2011).

**OPTIONAL**

N/A