INSTITUTO DE FÍSICA
FACULTAD DE FÍSICA

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CURSO            :    LABORATORIO DE IMÁGENES MÉDICAS
TRANSLATION      :    LABORATORY OF MEDICAL IMAGES
NUMBER           :    FMD3019
CREDITS          :    10 UC / 6 SCT
MODULES          :    2
REQUISTS         :    SIN REQUISITOS
RESTRICTIONS     :    030401, 030501, 030801, 030802, 030803
CHARACTER        :    OPTATIVE
FORMAT           :    THEORETICAL LECTURES, LABORATORY
QUALIFICATION    :    STANDARD
KEY WORD         :    MEDICAL PHYSICS, MEDICAL IMAGING, RADIOACTIVITY, X-R
FORMATIVE LEVEL  :    MAGISTER
DISCIPLINE       :    PHYSICS
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I.   COURSE DESCRIPTION

This course provides the student a direct contact with digital medical image processing. It considers computational programming of basic tools and techniques in the area, to generate a deep learning of the most relevant concepts, and the use of specialized software, at the user level, for more sophisticated applications.

II.   LEARNING OUTCOMES

•   Describe the most relevant concepts associated with digital medical image processing.
•   Create computer programs that solve typical problems in digital medical image processing.

III.   CONTENT

•   Image representation.
•   DICOM.
•   Intensity operations.
•   Filters in the space domain.
•   Filters in the frequency domain.
•   Segmentation.
•   Registration.
•   Rendering.
•   Application to current problems.

IV.   METHODOLOGICAL STRATEGIES

-    Theoretical lectures
-    flipped classes
-    personal research
-    computer programming work (individual and in groups).

V.   EVALUATIVE STRATEGIES

•   Homeworks (30%)
•   Controls (40%)
•   Proyect (30%)

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FACULTY OF PHYSICS / DECEMBER 2020

VI.   BIBLIOGRAPHY

REQUIRED

•   W. Birkfelner. Applied Medical Image Processing – A Basic Course –, 2nd ed. (CRC Press, Taylor & Francis Group, LLC, Boca Raton, FL, 2011).
•   R. C. González and R. E. Woods. Digital Image Processing, 3rd ed. (Pearson Prentice Hall, Upper Saddle River, NJ, 2008).
•   O. Demirkaya, M. H. Asyali and P. K. Sahoo. Image Processing with Matlab – Applications in Medicina and Biology. (CRC Press, Taylor & Francis Group, Boca Raton, FL, 2009).

OPTIONAL
N/A