

Physics for BioImaging



Niveau d'étude
Master 2



ECTS
6 crédits



Composante
UFR des
Sciences
fondamentales
et biomédicales

Présentation

DESCRIPTION

Physical principles behind biomedical imaging technologies. Beginning with the fundamental principles for X-ray computed tomography, magnetic resonance imaging, nuclear medicine and ultrasound students will learn the physical concepts related to detectors and image formation. Principles are related to practical imaging configurations so that knowledge can be applied to better select and design imaging toward new applications. Most recent advances in biomedical imaging technologies such as novel detectors and multi-wave techniques are presented by expert researchers to prepare for the biomedical imaging environment of the future.

Ultrasound physics for wave propagation and scattering are explained and further developed to include principles behind multiwave imaging and ultrasound therapy. Physics principles behind the detection of ultrasound contrast agents are covered. Physics of ionizing radiation is explained PET Gamma Cameras and PET scans are explained along with the basic physics of computed tomography. New flat panel detectors for conventional radiology and strategies for dose reduction and other new perspectives are presented. . MRI principles and diffusion and spectrometry MRI are explained (Means to use MRI to evaluate microcirculation and inhomogeneous Magnetization transfer). Imaging-guided therapies are increasingly used, replacing surgery in certain situations. Simulator work will allow the student to become familiar with these techniques.

PRÉ-REQUIS NÉCESSAIRES

M1 Ingénierie de la Santé, autre M1 du secteur Sciences de la Vie, Parcours d'Initiation à la Recherche.

En bref

CONTACTS

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LIEU(X)

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