LGBIO2050

2012-2013

Medical Imaging

5.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Lee John (compensates Macq Benoît) ; Bol Anne ; Peeters Frank ; Macq Benoît ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Main themes :	This course will cover acquisition and processing of medical images. The first part of the course will introduce the different imaging modalities (X-ray, CT, MRI, US, nuclear medicine), cover ing the general physical principles, the main parameters which characterize image quality (e.g. SNR, spatial resolution, sensitivity) and artefact management. Clinical applications of these imaging systems will illustrate their use in medical diagnosis. The second part of the course will review algorithmic tools available for image processing, particularly image segmentation, coregistration of images acquired with different modalities and statistical atlas construction. Storage and image transmission systems (PACS) will be discussed together with image format (DICOM), image compression (JPEG2000) and annotation methods. Finally, advanced imaging techniques (functional MRI, perfusion and diffusion MRI measurements) and image guided treatement and surgery will be reviewed.
Aims :	- understanding of physiological and anatomical bases required for medical imaging - understanding of the different acquisition techniques of medical images - ability to perform medical image processing and analysis - ability to efficiently choose between different acquisition techniques and different processing methods for medical images - ability to use computing tools required for medical image processing *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Content :	- introduction to medical imaging modalities - parameters which characterize an image - study of clinical cases - medical image processing and analysis - medical image storage and transmission - advanced imaging techniques Method : application of analysis methods on clinical cases will be performed in Matlab
Other infos :	N / A
Cycle and year of study :	> Master [120] in Electro-mechanical Engineering > Master [120] in Mechanical Engineering > Certificat universitaire en physique d'hôpital > Master [120] in Biomedical Engineering > Master [120] in Computer Science and Engineering > Master [120] in Electrical Engineering > Master [120] in Mathematical Engineering > Master [120] in Physics
Faculty or entity in charge:	GBIO