

IMAGING TISSUE CHARACTERIZATION - INTRODUCTION TO RADIOMICS¹

ECTS	Cours (h)	T.D. (h)	T.P. (h)	Projects	Stage (semaines)
3	21	3	3		

Mention du master transmettant la fiche UE :	IdS
Composante de gestion de l'UE :	Polytech / Ecole Centrale Lyon
Responsables de l'UE :	CANET SOULAS Emmanuelle emmanuelle.canet@univ-lyon1.fr
Statut du responsable :	PR

PROGRAMME DE L'UNITE D'ENSEIGNEMENT :

Today, medical imaging is able to characterize biological tissues and their pathological evolution using dedicated quantitative parameters in each imaging technology. This teaching unit proposes to provide the keys to understand possibility and limit of the different imaging modalities, and to introduce essentials to start with radiomics. The courses will focus on the followings:

- Key elements of quantitative imaging for morphological and functional characterization of biological tissues using examples from cancer, cardio-vascular or cerebral diseases (8 h). Pathological analysis of tissue samples will be used as gold standard (2h)
- Intrinsic possibilities of each imaging modality (contrast, functional index) (= US, TDM, MRI, Optical) and the importance of contrast agents for cellular and molecular imaging (8h)
- An introduction to radiomics, the emerging scientific field at the cross-road of quantitative imaging and high-dimensional imaging data analysis (2h)

Nuclear medicine and radio-pharmaceuticals are not specifically addressed in the module, but may be used in comparative studies.

The tutorial (3 h) consists in practicing by group of 3 students to prepare an oral presentation on a proposed corpus of recent scientific articles addressing a medical question with imaging tissue characterization (group evaluation).

One practical session (15 students per group) enables to discover practical issues of either image acquisition (imaging platform) and/or of multi-parametric image analysis (image analysis platform).

The final evaluation will be a written test with questions related to selected documents of recent scientific articles on medical imaging.

MUTUALISATION :

Si l'UE est mutualisée avec d'autres mentions de master, indiquez la liste de ces mentions.