

Virtual Exchange Global Alliance



EPFL	Fundamentals of biomedical imaging: FMRI (PHYS-438)		
Course description	The goal of this course is to illustrate how modern principles of basic science approaches are integrated into the major biomedical imaging modalities of importance to biology and medicine, with an emphasis on those of interest to in vivo.		
Domain	Life sciences		
Keywords	ultrasound	mri	pet spect
Prerequisites	General Physics I-III		
Level	Master		
Number of credits and workload	4 credits	4 hrs per week	56 hrs in total
Semester period and Start date course	Semester 2	Start date: TBA	
Application deadline	TBA		
Full course description	<p>This course will focus on magnetic resonance imaging, also known as an MRI. In the first part of the course, the dynamic of spins in a magnetic field is described, leading to the essential notions of magnetic resonance (MR), excitation and relaxation. We will also discuss the basic mechanisms of image reconstruction, MR spectroscopy and functional MRI.</p> <p>You will learn how existing physical principles transcend into bio-imaging and establish an important link into life sciences, illustrating the contributions physics can make to life sciences. Practical examples will be shown to illustrate the respective imaging modality, its use, premise and limitations, and biological safety will be touched upon.</p> <p>During this course, you will develop a good understanding of the mechanisms leading to tissue contrast of the bio-imaging modalities covered in this course, including the inner workings of the scanner and how they define the range of possible biomedical applications. You will be able to judge which imaging modality is adequate for specific life science needs and to understand the limits and promises of each modality.</p>		

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Platform and link to course description	edX	https://courses.edx.org/courses/course-v1:EPFLx+FndBiolmg2x+3T2016/course/
Course description in study guide	MA	
Lecturer(s)	Rolf Gruetter	
Extra Course information	This course is the second part of 2 courses on fundamentals of biomedical imaging. You'll find the first part here: Fundamentals of Biomedical Imaging: Ultrasounds, X-ray, positron emission tomography (PET) and applications	
Final examination date and time /period	TBA	
Examination registration deadline or drop-out deadline	Examination registration before: TBA Drop- out deadline: TBA	
Type of examination	Written	
Midterm examination?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	
Previous exam papers available	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	
Resit? and date	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	
Grade release and transcript release	TBA	