



EUROPEAN UNIVERSITY FOR CUSTOMISED EDUCATION

STUDY GUIDE

Medical Image Processing

Organised by

University of Mons (UMONS)









1. IDENTIFYING DATA.	
· Course Name.	Medical Image Processing
· Coordinating University.	UMONS
· Partner University(ies) Involved.	<i>N</i> /A
· Course Field(s).	Electrical engineering, computer vision
· Related Study Programme.	Polytech >> electrical engineering => master 1 of " Data Science for Dynamical Systems"
· Course Code.	I-ISIA-013
· ISCED Code.	0713
· SDG.	SDG 3: "Good health and well-being"
· Study Level.	Master (M)

Number of ECTS credits allocated.	3
· Mode of Delivery.	Hybrid format (available both on-site and online)
· Language of Instruction.	English
· Delivery Period.	2 nd semester
· Course Dates.	9 th February – 16 th March
• Precise Schedule of the Lectures.	2 hours each Thursday at 8h15 (9/2, 16/2, 23/2, 2/3, 9/3, 16/3)
· Key Words.	Medical Imaging, image reconstruction, MRI, CT scan, PET scan, image registration, image segmentation
· Catchy Phrase.	Understand medical images and practice!
· Link to Course Guide.	N/A

 Prerequisites and co- requisites. 	The students need to have checked the CVMI (Computer Vision & Machine Intelligence) course. No other prerequisites: it is an introductory course. English: B1 minimum
• Number of EUNICE students that can attend the Course.	70
· Course inscription procedure(s).	Registrations through EUNICE website

2. CONTACT DETAILS.





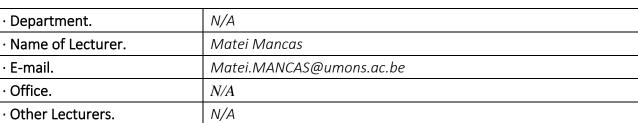












3. COURSE CONTENT.

The module will focus on medical Imaging, image processing and computer vision

4. LEARNING OUTCOMES.

1/ Knowing and understanding the different types of medical imaging 2/ Understanding how they are visualized 3/ Some basic anatomy knowledge 4/ Medical images preprocessing 5/ Medical images registrations 6/ Medical images segmentation 7/ Some tools to read, visualize and process medical images

5. OBJECTIVES.

[1/Understand medical images, 2/Pre-process, register, segment medical images]

6. COURSE ORGANISATION.			
UNITS			
1.	Chapter I: Introduction to Medical Imaging 1/ Introduction 2/ Instrumentation and imaging modalities 3/ Basic visualization		
2.	Chapter II: Image Reconstruction & Visualization 1/ Image Reconstruction 2/ Images & data 3/ Visualization		
3.	Chapter III: Anatomy, debluring & registration 1/ Anatomy and imaging modalities 2/ Medical images denoising 3/ Medical images registration		
4.	Chapter IV: Medical Images Segmentation 1/ Medical Imaging: Why ? 2/ Some segmentation techniques used in medical imaging 2.1/ Global segmentation 2.2/ Local segmentation 2.3/ Knowledge/Atlas-based segmentation 3/ Conclusion		
5	Chapter V: Tools and Applications 1/ Knowledge-based Segmentation 2/ ITK & Tools 3/ Medical Image Retrieval Example 4/ Clinical Examples 5/ New Developements for Registration 6/ Towards better atlasses		
LEARNING RESOURCES AND TOOLS.			
Moodle Material			
PLA	PLANNED LEARNING ACTIVITIES AND TEACHING METHODS.		







Lectures

7. ASSESSMENT METHODS AND CRITERIA.

Exam : oral with 30 minutes of preparation on a set of questions. The first part will be more about course questions, the second part will be a discussion around an open question.

OBSERVATIONS.

8. BIBLIOGRAPHY AND TEACHING MATERIALS.

The course is an introductory one, no need for reading

