

# Master in Life Sciences

A cooperation between  
BFH, FHNW, HES-SO, ZFH

<b>Module title</b>	<b>Medical Imaging and Image Processing</b>
<b>Code</b>	BECS3
<b>Degree Programme</b>	Master of Science in Life Sciences
<b>Group</b>	BECS (Biomedical Engineering and Computational Science)
<b>Workload</b>	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
<b>Module Coordinator</b>	<b>Name:</b> Dr. Antje Knopf <b>Phone:</b> +41 (0)61 228 62 24 <b>Email:</b> <a href="mailto:antje.knopf@fhnw.ch">antje.knopf@fhnw.ch</a> <b>Address:</b> FHNW, HLS, Hofackerstr. 30, 4132 Muttenz
<b>Lecturers</b>	Dr. Antje Knopf, FHNW Dr. Ye Zhang, Paul-Scherrer-Institut Further guest lecturer from RaySearch Laboratories, EPFL and others
<b>Entry requirements</b>	Bachelor level of analysis, linear algebra, statistics, Matlab programming skills There is an online tutorial available for students without Matlab skills.
<b>Learning outcomes and competences</b>	After completing the module, students will be able to: <ul style="list-style-type: none"> <li>• apply image processing methods to basics image analysis problems</li> <li>• understand the typical image processing chains on clinical applications</li> <li>• knowing some advanced image processing methods</li> </ul>
<b>Module contents</b>	<ul style="list-style-type: none"> <li>• Image: Representation, File Formats, Image Quality</li> <li>• Medical Image Acquisition Systems: Radiology, CT, MRI</li> <li>• Image Processing in Clinical Practice: Processing Chains</li> <li>• Operations in Intensity Space</li> <li>• Filtering in Spatial Domain and Feature Detection</li> <li>• Segmentation and morphological Operations</li> <li>• Feature Description and Classification</li> <li>• Spatial Transforms and Registration</li> <li>• Advanced Image Analysis Topics</li> <li>• Practical Work with Matlab and other Tools</li> </ul>
<b>Teaching / learning methods</b>	Lectures, accompanied with practical work
<b>Assessment of learning outcome</b>	1. Seminar talk (1/3) 2. Final examination, closed book (2/3)
<b>Format</b>	7-weeks
<b>Timing of the module</b>	Spring semester, CW 15-21
<b>Venue</b>	Blended learning format. Presence sequences take place in Olten
<b>Bibliography</b>	Wolfgang Birkfellner, 2014. Applied Medical Image Processing. CRC Press Reinhard Klette, 2014. Concise Computer Vision. Springer Verlag
<b>Language</b>	English
<b>Links to other modules</b>	
<b>Comments</b>	
<b>Last Update</b>	11.08.2022