Biomedical Imaging Methods
between April 7 and 29, 2016.

The course consists of lectures and demonstrations, and additional optional parts. Please find the current version of the programme below.

Responsible person:
Dr. Simo Saarakkala, Faculty of Medicine

Registration to the course: WebOodi and if not possible (doctoral students), e-mail to leena.seiteri(at)oulu.fi

The deadline to register is April 1st. The lectures are open to all, but the number of participants to the demonstration is limited to 40.

580402S BIOMEDICAL IMAGING METHODS (1 - 5 ECTS)
Spring 2016

Lectures (23 h):

April 7, 2016 (place: P107)
12:15 – 12:45 Simo Saarakkala: Introduction to the course structure and organization.
12:45 – 13:30 Seppo Vainio: Introduction to biomedical imaging.
13:30 – 14:00 Break
14:00 – 15:30 Seppo Vainio: Basics and applications of optical projection tomography (OPT).

April 12, 2016 (place:338B)
12:15 – 14:00 Mikko Nissi: Basics and applications of magnetic resonance imaging (MRI).
14:00 – 14:15 Break
14:15 – 14:30 Antti Salo: Basics and applications of in vivo optical imaging technique.
14:30 – 15:00 Veli-Pekka Ronkainen: Basics and applications of Multiphoton and Light sheet microscopy.

April 13, 2016 (place: P107)
14:45 – 16:00 Lassi Rieppo: Basics and applications of Polarized Light Microscopy (PLM).

April 14, 2016 (place: 338B)
12:15 – 13:45 Matti Kinnunen: Basics and applications of optical coherence tomography (OCT).
13:45 – 14:15 Break

April 19, 2016 (place: 338B)
13:45 – 14:15 Break
14:15 – 15:00 Zoltan Szabo: Ultrasound imaging of small animals.

April 21, 2016 (place: 338B)

April 26, 2016 (place: P117)
13:45 – 14:00 Break
14:00 – 15:30 Gabriela Lorite: Basics and applications of Atomic Force Microscopy (AFM) – Part II.
Demonstrations (10 h):

April 27, 2016
12:00 – 15:00 Demonstration I

April 28, 2016
09:00 – 12:00 Demonstration II
13:00 – 16:00 Demonstration III

April 29, 2016
09:00 – 12:00 Demonstration IV
13:00 – 16:00 Demonstration V

Zoltan Szabo: Ultrasound imaging of small animals in vivo (Kontinkangas campus)
Ilkka Pietilä: Optical projection tomography ex vivo (Kontinkangas campus)
Sakari Karhula: Micro-CT imaging ex vivo (Kontinkangas campus)
Joonas Oinas: FTIR imaging ex vivo (Linnanmaa campus)
Gabriela Lorite: Atomic Force Microscopy ex vivo (Linnanmaa campus)

Practical exercise + report:
The practical exercise includes hands-on measurements and analysis of biological samples ex vivo with one of the following imaging equipments: 1) FTIR imaging microscope (located at the Linnanmaa campus), 2) Micro-CT device (located at the Kontinkangas campus), or 3) Polarized Light microscope (located at the Kontinkangas campus). There is a possibility to measure and analyze your own tissue samples. Each student conducts a practical exercise with only one imaging equipment.
The imaging equipment and time for the practical exercise will be agreed after the first lecture.

Written final exam:
Written final exam will be organized on May 6, 2016 at 09:00 – 12:00 (place: A101). It will be based on the materials given from lectures, demonstrations, and practical exercise. The exam will be graded in a scale of 1-5.

Obtained credits:
Participating all the lectures: 1 ECTS
+participating all the demonstrations: 2 ECTS
+conducting the practical exercise and report: 3 ECTS
+taking the final exam 5 ECTS