

BIMA3217 Hands-on Advanced Optical Microscopy (3 ECTS)

Course description:

Learn fluorescent microscopy techniques through practical sessions. During the course students are familiarized with microscope optics through theoretical lectures and a hands-on session, acquire practical skills on widefield, confocal, and STED techniques and learn how to prepare test samples and use them to perform microscopic quality control procedures such as measuring point spread function. Furthermore, students prepare biological samples, which they use to image and perform basic image analysis on. Finally, the work is reported in the form of a written report.

Contents:

Theoretical lectures, hands on fluorescent microscopy instrumentation and optical components, hands on sample preparation, Fluorescence applications: widefield, confocal and STED

Modes of Study:

Introductory lectures, laboratory work in groups, practical training in widefield, confocal and STED, written essay in the scientific article format

Evaluation:

Pass/Fail

Proceeding Studies:

Bioimaging and microscopy 5 ECTS, Fluorescence in bioanalytical research 4 ECTS. Advanced microscopy 5 ECTS is a plus.

Recommended Year of Study:

All interested master's and PhD students are encouraged to apply. However, it is mostly aimed for second year bioimaging master's students who are doing internships/master's theses.

Teachers in charge:

Elnaz Fazeli (elnfaz (at) utu.fi)

Joanna Pylvänäinen (jpylvana (at) abo.fi)

Elena Tcarenkova (eletca (at)utu.fi)

Registration:

Please send an Email to Elnaz Fazeli (elnfaz (at) utu.fi) to register to the course. Include your background with a short description of your project, samples, sample preparation protocol you are currently using and the type of image processing you would need in your project.

Learning outcomes:

Practical sessions for sample preparation, microscopy quality control and basic image analysis. Moreover, students are familiarized with optical microscopy setup and learn how to write a scientific report.

Implementation methods: Lectures: 7 hours

Hands-on optics: 3 h

Hands-on laboratory work: 6 h

Imaging sessions: 12 h (1h /student)

Image processing: 4 h Independent study: 30 h

Written report work: 27 h

Programme:

Week number	Session	Date	Time
20	Practical session	11.5.2020	10-12
20	Instrument session	13.5.2020	10-12
20	Building a microscope session	13.5.2020	13-16
20	Sample preparation	15.5.2020	10-16
21	Nikon session 1	18.5.2020	9-12
21	Nikon session 2	19.5.2020	9-12
21	SP5 session 1 & 2	22.5.2020	9-16
22	STED session 1	25.5.2020	9-12
22	STED session 2	26.5.2020	9-12
22	Nikon session 3	27.5.2020	9-12
22	Nikon session 4	28.5.2020	9-12
22	SP5 session 3 & 4	29.5.2020	9-16
23	STED session 3	1.6.2020	9-12
23	STED session 4	2.6.2020	9-12
23	Image analysis	3.6.2020	9-13