

Optical Methods in Neurobiology

Tues & Thurs @ 1:00 - 3:00 pm in 201 SR2

Graduate Course

No Required Text

Reading material will be provided

Grade Assignment

1. Student Presentation (25% of grade)
20 - 30 min presentation of one or more assigned paper(s)
2. Lab Practicum (25% of grade)
Complete an assigned task on the Olympus FV1000 LSM]
3. Final Exam (50%)
Comprehensive, problem-based take-home exam

Topics for Consideration

Light

Properties

Electromagnetic Spectrum

Detection & Measurement

Characteristics of (various) Light Sources

Optics

Ray Optics (refraction)

Wave Optics (diffraction)

Lenses (composition, properties, distortion)

Image

Visual Reception/Perception

Real vs Virtual

Digital Image

Light microscopy

Design

Practical aspects

Contrast enhancement

Photomicrography

Fluorescence microscopy

Fluorescence & FRET

Filters

Design

Confocal Approaches

Laser Scanning Microscopy

Lasers

Design

Practical Aspects

Multiphoton LSM

Non-linear Optics

Design

Practical Aspects

Molecular Tools

Fluors

Fluorescent Reporters

Ion/Ligand Sensitive Dyes

Advanced Optical Techniques

To be determined