

BIOL 695 Microscopy for Life Scientists Spring 2019

2 credit lecture course for graduate students

Instructors:

Dr. Daniel Suter, Department of Biological Sciences

Dr. Andy Schaber, Imaging Facility Director, Bindley Bioscience Center

Time: WF 10:30-11:20 am

Location: LILY G458



Purpose of the course

Many life scientists use advanced imaging techniques without fully understanding the underlying principles of sample preparation, imaging formation, and data analysis. The goal of this course is to provide graduate students with the fundamental knowledge in various aspects of light microscopy, including image formation in a light microscope, modern fluorescence imaging techniques, sample preparation, digital image processing and analysis with emphasis on how to optimally image and analyze biological samples. Completing this course will help students to make better use of available techniques and design new experiments in their research.

Major topics include:

1. How light travels through a light microscope to form an image
2. Image formation in bright-field, phase contrast, DIC, epifluorescence, confocal, and super-resolution microscopy
3. Acquisition, storage, and display of digital images
4. How to use Image J (<http://rsbweb.nih.gov/ij/>) for digital image processing and analysis

Additional topics include how to handle and adjust common hardware components, how to recognize and correct common image artifacts, and how to prepare biological samples for best imaging. Concept-based lectures are complemented with some hands-on demonstrations in the Bindley Imaging Facility.