

**CAMB 709 Quantitative Imaging and Analysis for Biologists (QIAB)**  
**Fall 2021**

<b>Course Coordinators:</b>	Andrea Stout, Ph.D: <a href="mailto:astout@pennmedicine.upenn.edu">astout@pennmedicine.upenn.edu</a> Melike Lakadamyali, Ph.D: <a href="mailto:melikel@pennmedicine.upenn.edu">melikel@pennmedicine.upenn.edu</a>
<b>Teaching Assistants:</b>	Charlie Bond: <a href="mailto:bondcr@pennmedicine.upenn.edu">bondcr@pennmedicine.upenn.edu</a> Melina Gyparaki: <a href="mailto:melinat@sas.upenn.edu">melinat@sas.upenn.edu</a>
<b>Required materials:</b>	A laptop with the free software Fiji ( <a href="https://fiji.sc/#download">https://fiji.sc/#download</a> ) installed
<b>Lectures:</b>	In-person on Tuesdays, 10:15 –11:45 AM in room 253 BRB II/III
<b>Workshops:</b>	In-person on Thursdays, 10:15 – 11:45 AM in room 253 BRB II/III
<b>Quizzes:</b>	On Canvas
<b>Fiji Exercises:</b>	Submitted through Canvas
<b>Final Presentations:</b>	During class sessions 11/30/21 and 12/02/21
<b>Grading for the course:</b>	Your final grade will be based on the following:

**Participation (30%):** participation during Tuesday class sessions and attendance at Thursday workshops

**Out-of-class homework (30%):** Canvas quizzes and Fiji exercises. We will not assign grades but will keep track of each student's submissions

**Final presentations (40%):** The last two class sessions are set aside for student presentations: each student must give a very short (no more than 10 minutes) presentation that is either (a) an explanation of an image analysis protocol that makes use of one or more methods discussed in this class; or (b) an instructional presentation on how to use a Fiji plugin or other open source software (such as CellProfiler) that we did not cover in class.

**CAMB 709 Quantitative Imaging and Analysis for Biologists (QIAB)**  
**Fall 2021**

<b>Tues, Sep 7</b>	<b>Light microscopy fundamentals</b>	<b>Andrea Stout</b>
Thurs, Sep 9	Microscopy Practical Sessions	Melike Lakadamyali, Andrea Stout
<b>Tues, Sep 14</b>	<b>Image data: signals, noise, sampling</b>	<b>Andrea Stout</b>
Thurs, Sep 16	Microscopy Practical Sessions	Melike Lakadamyali, Andrea Stout
<b>Tues, Sep 21</b>	<b>Intro to Fiji &amp; digital data</b>	<b>Andrea Stout</b>
Thurs, Sep 23	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Sep 28</b>	<b>Fluorescent probes; sample prep</b>	<b>Melike Lakadamyali</b>
Thurs, Sep 30	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Oct 5</b>	<b>Processing and simple measurements</b>	<b>Andrea Stout</b>
Thurs, Oct 7	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Oct 12</b>	<b>Macros</b>	<b>Andrea Stout</b>
Thurs, Oct 14	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Oct 19</b>	<b>Intro to segmentation and object labels</b>	<b>Andrea Stout</b>
Thurs, Oct 21	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Oct 26</b>	<b>Working with 3D and 4D data</b>	<b>Andrea Stout</b>
Thurs, Oct 28	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Nov 2</b>	<b>Machine learning with Fiji and ilastik</b>	<b>Andrea Stout, Sandra Maday</b>
Thurs, Nov 4	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Nov 9</b>	<b>Quantifying dynamic processes</b>	<b>Melike Lakadamyali</b>
Thurs, Nov 11	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Nov 16</b>	<b>Guest Lecture</b>	<b>Andy Moore, HHMI Janelia</b>
Thurs, Nov 18	Hands-on Fiji workshop	Andrea or Melike and TA
<b>Tues, Nov 23</b>	<b>Quantitative Colocalization</b>	<b>Andrea Stout</b>
Thurs, Nov 25	THANKSGIVING – NO CLASS	
<b>Tues, Nov 30</b>	<b>Student presentations I</b>	
<b>Thurs, Dec 2</b>	<b>Student presentations II</b>	