

BIOF 350: Image Analysis
Fall 2019
MW 12:00-1:15 plus lab Monday 3:00-5:00

Instructor Information

Name: S. Seth Long, Ph.D
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Office Hours: Monday 2:00-3:00, Wednesday 11:00-12:00

Class Website

The class website is located at <http://isoptera.lcsc.edu/~seth/biof350>. Look here for assignment information, lecture notes, etc.

Course Goals

At the end of the course, students should

- Understand how to approach image processing problems in bioinformatics
- Understand imaging technologies used in biology, including microscopy and magnetic resonance imaging
- Understand common image processing techniques
- Have experience with hypothesis testing in bioinformatics

Textbook

There is no textbook for this course. Instead, a variety of online resources will be used.

Grading

Your grade will be calculated based on the following items:

Item	Percentage of grade
Midterm	15%
Final	15%
Class Project	45% total
1 Presentation	15% total
Lab Assignments	10% total

Grades will be assigned according to a standard curve, that is:

- A: 90% +
- B: 80%- 90%
- C: 70%- 80%
- D: 60%- 70%
- F: less than 60%

Use of + or - grades (such as B+ or A-) and curves will be at the instructor's discretion.

Deadlines and late work

Late work will not be accepted except by instructor discretion in unusual circumstances. However, partial credit will be given for partially-completed work. It is better to turn in an unfinished assignment for partial credit than to not turn in something on time and receive a 0.

Attendance

Attendance will not be taken in this class except as required for financial aid purposes. However, all material presented during lecture and student presentations is "fair game" for the midterm and final, and some of this material may not be in the book as well. Therefore I recommend that you always attend class.

Academic Dishonesty

Cheating on any assignment will result in failing the class. Some things which constitute cheating in this class are:

- Copying another student's homework
- Turning in homework created by another student
- Reading another student's answers on a test
- Sharing all or part of your completed homework with another student before the assignment is due

Appropriate collaboration on homework involves sharing ideas with other students only, not source code! Although it is often tempting to help another student by showing them how your completed program works, this is not helpful to their learning. However, this does not mean you cannot collaborate with other students on homework. Sharing of ideas, principles, and algorithms is permitted and encouraged.

Tentative Fall 2019 BIOF 350 Image Analysis Calendar	
Week	Course Content
Aug 19	Introduction, Loading and Working With Images
Aug 26	Microscope technologies
Sep 2	Labor day Monday, Sample Preparation: How it works from living organism to microscope images
Sep 9	3D Image Data: Working with Confocal, SBEM, and MRI images
Sep 16	Boundary Detection and Segmentation
Sep 23	Contrast, Editing Techniques to Highlight Image Features
Sep 30	Developing an Efficient User Interface for Image Analysis Software
Oct 7	Presentations, research project start
Oct 14	Continued Presentations
Oct 21	Midterm and results
Oct 28	Introduction to Supervised Machine Learning
Nov 4	Applying Machine Learning to Image Segmentation
Nov 11	Introduction to Graphics Processors
Nov 18	Using Graphics Processors to Edit Images
Nov 25	Thanksgiving Break
Dec 2	Future Imaging Technologies in Development, Course Conclusion, research projects due
Dec 9	Final Exam