

January 16, 2014, Naohiro Kato

Syllabus: Spring 2014 BIOLOGICAL SCIENCES 7800 Section 3
Cell Imaging

Course Number: BIOL7800

Section Number: 3

Course Type: Lecture and Laboratory, 3 credit hours

Course Title: Cell Imaging

Enrollment Limit: 12

Meeting Days and Time: Tuesday & Thursday 10 : 30 am – 11 : 50 am

Meeting Rooms: Life Sciences Annex A245

Instructor: Naohiro Kato, Ph.D.

Associate Professor, the Department of Biological Sciences, LSU

Office: Room 226, Life Sciences Building, LSU, Baton Rouge, LA

Office Hours: Friday 3 pm – 4 pm (a small message board is available on the office door in case of absence) or By Appointments

Email: kato@LSU.edu

Cell imaging is a technique that analyzes not only the size and shape of cells but also biochemical reactions within them. The images are stored as binary data so that researchers can analyze light intensity in the various areas of the cells accurately. The images are shared in different formats, such as prints, PowerPoint presentations, and websites. Scientific publishers require online submission. It is necessary in the modern science society of today to understand cell-imaging technique from data acquisition to publication.

Course Objective:

The objective is to understand cell-imaging techniques from the acquisition to the presentation. At the end of the course, students will be able to 1) select molecular tools, 2) obtain images, 3) analyze them and 4) publish the result within the science community.

Course Description:

The course is divided into four sections. *First*, the students will receive lectures to understand cell imaging; image formation, fluorescence microscopy, and image analysis. *Second*, the students will be trained to use fluorescence microscopes available in Socolofsky Microscopy Center. *Third*, the students will conduct a research project built upon knowledge gained in the course. *Finally*, the individual students will publish the project result in three different formats, PowerPoint, poster, and peer-review submission.

Prerequisites:

Basic knowledge of cell and molecular biology such as functions of cellular components and biochemical reactions are required (BIOL 3090, Cell Biology or equivalent).

Required Purchases:

None

Course Resources:

- 1) <http://moodle2.lsu.edu>
- 2) <http://ibiology.org>
- 3) <http://www.microscopy.fsu.edu>

Course Materials:

Cells, fluorescence microscopes, personal computers, imaging software, and scientific journals. All physical materials will be provided in the class. All digital materials will be provided through Moodle.

Course Management System:

Announcements will be made in class as well as on Moodle.

Homework:

Lectures of this course are built around the flipped classroom model. As homework, students first complete assignments by watching lecture videos in website. Students then meet in classroom for clarification and in-depth discussions around topics talked in the lectures. The students must submit a topic that is *the least clear* in the lecture videos to Moodle ***at the latest 24h before the class begins.***

Use of fluorescence microscopes in Socolofsky Microscopy Center after hour:

Students who pass an examination that will be given during the course are entitled to receive a permission to use fluorescence microscopes in Socolofsky Microscopy Center *after normal operating hour.*

Research project and presentation:

The students will conduct a research project that use living cells and fluorescent probes during the course. The students will present the results in three formats (prints, PowerPoint, and peer-review submission).

Grading Polices:

Grading is based on accomplishment of homework, activities in research project, and quality of research presentation.

The final grade will be based on total 300 point.

Homework accomplishment: 100 point

Research project activities: 100 point

Research presentation quality: 100 point

The following performance rating scale is applied.

100 point: Performance far exceeds expectations due to exceptionally high quality of work performed in all essential areas of responsibility, resulting in an overall quality of work.

> 90 point: Performance consistently exceeds expectations in all essential areas of responsibility, and the quality of work overall is excellent.

> 80 point: Performance consistently meets expectations in all essential areas of responsibility, at times possibly exceeding expectations.

> 70 point: Performance does not consistently meet expectations – performance failed to meet expectations in one or more essential areas of responsibility.

Level 1 (U): Unsatisfactory

< 60 point: Performance is consistently below expectations in most essential areas of responsibility, and/or reasonable progress toward critical goals is not made.

Total point	300-270	269-240	239-210	209-100	< 100
Grade	A	B	C	D	F

Course Legal Statements:

Equal Opportunity:

All qualified students have equal opportunity in class without regard to race, creed, color, marital status, sexual orientation, religion, sex, national origin, age, or veteran's status.

Disabilities:

A student having learning disabilities should consult the instructor and Office of Disability Services (<http://disability.lsu.edu/>) before registration.

Academic Integrity and Civility:

Code of Student Conduct issued by the Office of the Chancellor

(<http://saa.lsu.edu/Code%20of%20Student%20Conduct%20August%2009.pdf>) will be applied.

Memo: