

SYLLABUS

QBIO 105: Introduction to Quantitative Biology Seminar

This course is a required course for students majoring in Quantitative Biology (<http://qbio.usc.edu>) and can only be taken by QBIO students.

Spring 2018

Time and Location: Mondays, 3:30-5:10 pm in RRI 421

Course Instructors: Dr. Remo Rohs (rohs@usc.edu, RRI 413H; 213-740-0552)
<http://rohslab.cmb.usc.edu>

Dr. Michael Waterman (maw@usc.edu, RRI 403E; 213-740-2408)
<https://dornsife.usc.edu/labs/maw/>

Teaching Assistant: Brendon Cooper (bhcooper@usc.edu, RRI 413K)

Introduction (from the USC catalogue):

The Department of Biological Sciences offers a Quantitative Biology (QBIO) major to outstanding students who are already pursuing studies for the B.S. degree in Biological Sciences or who will be directly admitted into the QBIO major. This major allows biology students to achieve a fuller background in the quantitative sciences such as computer science and statistics that are essential for modern data driven biological science. The students will take an introductory seminar, participate in undergraduate research and write an honors thesis. This course is the introductory seminar for students taking the QBIO major. It is ideally taken as freshman but it can be taken after a student's transfer into the QBIO program. The instructors will introduce the general field of Quantitative Biology, its definition and role within the Biological Sciences, and its relationship with Chemistry, Computer Science, Engineering, Mathematics, Medicine, and Physics. The curriculum will include introductory lectures by the instructors, guest lectures, discussions, and student presentations.

Schedule:

1/08 Remo Rohs, Ph.D.
Professor of Biological Sciences, Chemistry, Physics, and Computer Science
Introduction to the course, requirements for the major, and finding a research lab

1/15 MLK Day – no class

1/22 Michael Waterman, Ph.D.
University Professor of Biological Sciences, Mathematics, and Computer Science
Reading genomes: 21st technology and 19th century mathematics

1/29 Andrew McMahon, Ph.D.
Provost Professor of Stem Cell Biology, Regenerative Medicine, and Biological Sciences
Director, Eli & Edythe Broad Center for Regenerative Medicine and Stem Cell Research
Developmental modeling of the human kidney

2/5 Andrew Hires, Ph.D.
Assistant Professor of Biological Sciences (Neurobiology)
Reading and writing thoughts with light

- 2/12 Scott Fraser, Ph.D.**
Provost Professor of Biological Sciences and Biomedical Engineering
Quantitative multiplex imaging of intact biological systems
- 2/19 President's Day – no class**
- 2/26 Ian Ehrenreich, Ph.D.**
Associate Professor of Biological Sciences (Molecular Biology)
The complex genetic underpinnings of traits in humans and model organisms
- 3/5 Keith Camoosa, Senior Vice President, Data Intelligence, Warner Bros.**
Adam Husein, Executive Director, Analytics, Data Science & Research, Warner Bros.
Big data engineering and data science at Warner Brothers
- 3/12 Spring Break – no class**
- 3/19 Naomi Levine, Ph.D.**
Assistant Professor of Biological Sciences (Marine Biology) and Earth Sciences
Microbes in a dynamic world: the impact of environmental variability on competition, diversity, and evolution
- 3/26 Arthur Toga, Ph.D.**
Provost Professor of Ophthalmology, Neurology, Psychiatry, and Biological Sciences
Director, USC Mark and Mary Stevens Neuroimaging and Informatics Institute
Mapping the brain in health and disease
- 4/2 Stacey Finley, Ph.D.**
Assistant Professor of Bioengineering, Chemical Engineering and Materials Science
Systems biology: What is it and what can it teach us?
- 4/9 Steve Kay, Ph.D.**
Provost Professor of Neurology, Biomedical Engineering, and Biological Sciences
Director, Michelson Center for Convergent Bioscience
Systems approaches to understanding circadian networks
- 4/16 Matt Cascino, M.D.**
Assistant Medical Director, Genentech
Using data science to facilitate drug development in systemic lupus erythematosus
- 4/23 David Agus, M.D.**
Professor of Medicine and Engineering
Director, Lawrence J. Ellison Institute for Transformative Medicine of USC
Can data help you live longer and be used to treat cancer?

Reserve lectures in case of speaker cancellations:

Remo Rohs, Ph.D.
Professor of Biological Sciences, Chemistry, Physics, and Computer Science
Mechanisms of gene regulation

Michael Waterman, Ph.D.
University Professor of Biological Sciences, Mathematics, and Computer Science
Discovering a path from mathematics to biology

Weekly Reports (10 points each; 120 points total): Reports should be no more than one page in length and should contain a maximum of one page with up to 500 words. Reports must be typed and printed. No electronic submissions will be accepted. Late reports will receive a maximum of 5 points. There are 12 weekly reports starting with the second lecture. Each weekly report must contain the following components: name of lecturer, date of lecture, and title of the lecture. List the main points raised during the lecture and discuss the meaning of each. The writing should consist of complete and grammatically correct sentences.

Grading: Your final letter grade in this course will be based upon all of your written reports, participation and discussion. Since there are no exams in this course, active participation and attendance are important components. The grade will consist of 120 points for weekly reports, and 30 points for participation and active discussion (150 points will be 100%).

Statement for Observance of Religious Holidays: USC's policy grants students excused absences from class to observe religious holidays: <http://ori.usc.edu/life/calendar/absences/> In this case, please contact your instructor in advance to agree on alternative course requirements.

Statement for Students with Disabilities: Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Statement on Academic Integrity: USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *Scampus*, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.