

SYLLABUS

QBIO 105: Introduction to Quantitative Biology Seminar

This course is a required course for students majoring in Quantitative Biology and can only be taken by QBIO students.

Spring 2023

Time and Location: **Tuesdays, 3:30-5:10 pm RRI 101**

Course Instructors: Dr. Jazlyn Mooney
 Gabilan Assistant Professor of Quantitative and Computational Biology

 Dr. Remo Rohs
 Professor and Chair of Quantitative and Computational Biology

Teaching Assistant: Yibei Jiang
 Ph.D. Student in Computational Biology and Bioinformatics

Introduction: 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, and discussions.

Schedule:

- 1/09 Dr. Jazlyn Mooney**
Gabilan Assistant Professor of Quantitative and Computational Biology
Dr. Remo Rohs
Professor of Quantitative and Computational Biology, Chemistry, Physics and Astronomy, and Computer Science
Course Introduction
- 1/17 Dr. Andrew McMahon**
W.M. Keck Provost and University Professor of Stem Cell Biology and Regenerative Medicine and Biological Sciences and Chair of Stem Cell Biology and Regenerative Medicine; Director, Eli and Edythe Broad CIRM Center for Regenerative Medicine and Stem Cell Research at USC
Regenerative Medicine – Present and Promise
- 1/24 Dr. Laura Melissa Guzman**
Gabilan Assistant Professor of Biological Sciences
Using Occupancy Models to Infer Trends of Bee Biodiversity in North America
- 1/31 Dr. Dani Byrd**
Professor of Linguistics
Human Speech Production, Perception, and Technology

- 2/7 Dr. Naomi Levine**
Associate Professor of Biological Sciences, Quantitative and Computational Biology, and Earth Sciences
Breaking Open the Microbial Black-box to Improve our Understanding of Biogeochemical Cycling
- 2/14 Dr. Helen Berman**
Professor (Research) of Quantitative and Computational Biology; Co-founder of the PDB
Coevolution of Structural Biology and the Protein Data Bank
- 2/21 Dr. Yolanda Gil**
Professor (Research) of Computer Science and Spatial Sciences and Principal Scientist at USC Information Sciences Institute; Viterbi School's Director of New Initiatives in AI and Data Science
A Brief Introduction to Artificial Intelligence
- 2/28 Dr. Julia Schwartzman**
Gabilan Assistant Professor of Biological Sciences
Bacterial Group Behaviors and Individuality
- 3/7 Dr. Amber Miller**
Dean, Dana and David Dornsife College for Letters, Arts and Sciences
Anna H. Bing Dean's Chair and Professor of Physics & Astronomy
How Do we Know What we Know?
- SPRING BREAK**
- 3/21 Dr. Jerry Lee**
Associate Professor of Clinical Medicine, Chemical Engineering and Material Science, and Quantitative and Computational Biology; Chief Science and Innovation Officer, Lawrence J. Ellison Institute for Transformative Medicine
Innovations at the Interface of Science, Engineering, and the Art of Medicine
- 3/28 Dr. Jazlyn Mooney**
Gabilan Assistant Professor of Quantitative and Computational Biology
Long-term small population size, deleterious variation, and altitude adaptation in the Ethiopian wolf, the world's most endangered canid
- 4/4 Dr. Scott Fraser**
Elizabeth Garrett Chair in Convergent Bioscience and Provost Professor of Biological Sciences, Biomedical Engineering, Physiology and Biophysics, Stem Cell Biology and Regenerative Medicine, Pediatrics, Radiology, Ophthalmology, and Quantitative and Computational Biology
Quantitative light imaging for quantitative biology
- 4/11 Dr. Amene Maghsoodi**
Gabilan Assistant Professor of Aerospace and Mechanical Engineering
Bacteriophages Injection Machine
- 4/18 Dr. Peter Foster**
Assistant Professor of Physics & Astronomy
Active Mechanics of Sea Star Oocytes

4/25 Dr. Adam de Smith

Assistant Professor of Population and Public Health Sciences

Mutational Signatures in Cancer

Weekly Reports (10 points each; 140 points total): Reports should be no more than one page in length with up to 500 words. Reports must be typed and submitted electronically via Blackboard. Late reports will receive a maximum of 5 points. There will be a total of 14 weekly reports. These reports will have two parts: (a) summary of the previous lecture, and (b) potential questions for this week's lecture. For part (a), you must state the name of the previous lecturer, the date and title of the lecture, and list the main points raised during the lecture and discuss the meaning of each. For part (b), you should research the current week's lecturer and topic and pose several potential questions.

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. Unless you are sick or test positive for COVID-19, in-person attendance is required. If you feel sick, do not attend class but contact us as soon as possible and accommodations will be made. The grade will consist of 140 points for weekly reports. Participation and active discussion will be considered for the final grade.

Statement for Observance of Religious Holidays: USC's policy grants students excused absences from class to observe religious holidays: <http://orl.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/>.