**Syllabus**

**BSCI 6/80107**

**Reproducible Quantitative Methods For Ecological Data**

*Fall 2021*

**Catalog description:** Using real, data driven examples from ecology and the environmental sciences, this course walks students through the process of scientific analysis and communication in a new, open, technologically enabled framework, and place technical skills in the context of reproducible research philosophy, ethics and regulations. Topics include data management and metadata, reproducible programming, and data visualization.

**Expanded description:** Technology is changing science: increasing the amount of data we can handle, and providing us with new ways of analyzing and sharing our work. The internet has increased connectivity within the scientific community and between scientists and the public. Additionally, many granting agencies are now requiring that scientific work they fund is made publicly available. Although daunting at times, taking an open-source, web-enabled approach to research presents an opportunity to both improve the reproducibility of scientific practice and to encourage broader participation in the scientific enterprise. Navigating this changing landscape effectively can help early career scientists handle their own data and statistical workflows more efficiently, build a network of collaborators, promote their own work, and engage in larger-scale problem solving. Using real, data driven examples from population and community ecology, this course will walk students through the process of scientific publication in this new, open, technologically enabled framework, and place technical skills in the context of reproducible research philosophy, ethics and regulations.

**Learning outcomes:**  
1. Demonstrate knowledge and an understanding of major concepts and theoretical principles in reproducible computational and quantitative methods.  
2. Engage in critical discussions about issues emerging around technology use in science.  
3. Use the concepts, language, and major theories of reproducibility in computational and quantitative research.

**Course prerequisites**: Graduate standing.

**Instructor:** Christie Bahlai

**E-mail:** cbahlai at kent dot edu

**Office Hours:** Immediately after class each Tuesday or by appt.

**Offered:** BSCI 6/80107 4 Credits

**Text:** (Optional!) Kristin Briney, Data Management for Researchers: Organize, maintain and share your data for Research Success 2015. Pelagic Publishing, Exeter, UK

**Meetings:** Lecture T, Th 9:15-10:30 AM, Seminar W 9:00AM- 10:40 AM, Zoom! <https://zoom.us/j/6124252635>

**Course website:** <https://reproducibleqm.github.io/RQM_FS21/>

**Attendance policy:** Your performance in this course will be proportional to the effort you put in- students are expected to attend class and engage in an earnest effort to master course material. This being said, please let me know if circumstances interfere with your ability to give this course your full attention.

**Code of conduct:** In brief, treat everyone (classmates, instructor, our external collaborators) with respect. Discrimination or harassment based on racial or ethnic background, citizenship status, religion (or lack thereof), political affiliation, gender identity/expression, sexual orientation, dis/ability status, appearance or body size will not be tolerated. Please make an effort to make an inclusive environment for everyone. Give everyone a chance to talk and an opportunity to contribute. Violations should be reported to the instructor. A SPECIAL NOTE: Your work in this class will be publicly available and recorded permanently on Github. Please conduct yourself accordingly.

**Graded work:**   
  
30% Discussion Participation  
Participation in class discussions- asking meaningful questions, demonstrating critical thinking.   
  
60% Final manuscript  
A real, bona-fide scientific manuscript, complete with reproducible analysis made openly available on Github. Students will be assigned small groups (3-5) and a set of real data, and students will be guided through the process of data management and documentation, a simple analysis, an experimental writeup, and submission of the manuscript to a peer reviewed, open-source journal. The goal with this paper is to create a research product that goes slightly beyond a ‘data paper.’ Students who are deemed to have contributed sufficiently by their peers will be awarded authorship if the manuscript is accepted for publication.   
  
10% Collaborator assessment  
Students will be evaluated by their peers for their level of contribution to the final manuscript product. Although I expect a fair bit of niche partitioning to occur in groups, students are expected to have left enough information about their respective roles so that group members are able to understand exactly what each other member did.

**Grading:**  
The grading scale for this course will be:  
100 - 93% = 4.0  
92 - 85% = 3.5  
84 - 80% = 3.0  
79 - 75% = 2.5  
74 - 70% = 2.0  
69 - 65% = 1.5  
64 - 60% = 1.0  
below 60% = 0.0  
  
Instructor will assess student effort and prior background in making final grading decisions. An earnest effort and a commitment to completing tasks to the best of a student's ability are key factors in earning a great grade in this class.

**Registration:** The official registration deadline for this course is 9/1/21. University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course. Each student must confirm enrollment by checking his/her class schedule (using Student Tools in FlashLine) prior to the deadline indicated. Registration errors must be corrected prior to the deadline.

The course withdrawal deadline is 11/03/21.

**Academic honesty**: Academic integrity and honesty is an essential topic of discussion in this class. University policy 3-01.8 deals with the problem of academic dishonesty, cheating, and plagiarism. None of these will be tolerated in this class. The sanctions provided in this policy will be used to deal with any violations. If you have any questions, please read the policy at http://www.kent.edu/policyreg/administrative-policy-regarding-student-cheating-and-plagiarism and/or ask.

**Statement regarding students with disabilities**: Kent State University is committed to inclusive and accessible educational experiences for all students. University Policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure equal access to course content. Students with disabilities are encouraged to connect with Student Accessibility Services as early as possible to establish accommodations. If you anticipate or experience academic barriers based on a disability (including mental health, chronic medical conditions, or injuries), please let me know immediately.

Student Accessibility Services (SAS) Contact Information:   
Location: University Library, Suite 100  
Email: [sas@kent.edu](mailto:sas@kent.edu)  
Phone: 330-672-3391; VP 330-968-0490  
Web: www.kent.edu/sas