

# S Y L L A B U S (v.1.0) - Spring 2023

## BISC 485 (4 units)

### *“Mechanisms of Bacterial Survival, Adaptation & Evolution”*

#### **Instructors:**

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#### **Meeting times:**

1:00PM - 3:50PM, Tuesdays in Room **RRI 321**

#### **Overview and Course Content:**

This is a literature-based seminar course designed to introduce graduate students and advanced undergraduates to current topics in microbial evolution and adaptation. The class will meet weekly with lectures by the instructor(s) alternating with student-lead discussions of papers chosen by the presenting students in consultation with the faculty. Individual topics will be covered approximately every two weeks. This course is designed to bring together students with diverse backgrounds including, but not limited to: Microbiology, Molecular Biology, Marine Biology, Geobiology, Earth Sciences, and Ecology.

**Prerequisites:** Familiarity with at least one of the disciplines listed above.  
Permission of instructor.  
Familiarity with basic chemistry and physics is assumed.  
Facility with algebra is recommended.

**Web Site:** Primarily BLACKBOARD.

#### **Course Credit:**

Presentation	40%
Term Paper	40%
Critical Evaluation	20%

All students are expected to read each week's assignments and fully participate in class discussions. Specific expectations will be discussed during the first class meeting.

#### **Course Policies:**

No special assignments for extra credit are permitted.

It may be necessary to make adjustments to the syllabus during the semester. Check Blackboard or class announcements and emails for updates.

The final paper will not be returned but will be retained for one semester by the faculty.

Any questions or concerns regarding these policies should be addressed to the instructors.

**Critical Analysis & Discussion is essential.** You must be an active participant in all discussions to get full credit, meaning you must read all assigned papers and be prepared to present and discuss any figures when called upon. Further, students are expected to bring their own questions and ideas on the given topic to the discussion. Therefore, you must attend all classes. Any absence must be accompanied by an excuse considered valid by faculty, presented in a timely fashion. In the event of more than one absence, students are expected to write a one page report on the week's discussion paper. An acceptable written excuse or documentation must be provided to the faculty. No special assignments for extra credit are permitted.

The final paper will not be returned but will be retained for one semester by the faculty.

## Statement on Academic Conduct and Support Systems

### Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity <http://equity.usc.edu/> or to the Department of Public Safety <http://capsnet.usc.edu/departments/departments-public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage [sarc@usc.edu](mailto:sarc@usc.edu) describes reporting options and other resources.

**Disability:** Students requesting academic accommodations based on a disability are required to register with the Office of Student Accessibility Services (OSAS) each semester. A letter of verification for approved accommodations can be obtained from OASA when adequate documentation is filed. Please be sure the documentation is delivered to Dr. Finkel or Dr. Neilson as early in the semester as possible. OSAS is open Mon-Fri, 8:30-5:00. The office is in GFS 120 and their phone number is 740-0776.

It may be necessary to make adjustments to the syllabus during the semester. Check the course web site or class announcements for updates.

Any questions or concerns regarding these policies should be addressed to faculty.

Week	Date	Topics
1	Jan 10	Introduction to the course – Wolfe-Simon <i>et al.</i> Science (2011) (KN)
2	Jan 17	Metabolism, trophism, niches. Part 1. (KN)
3	Jan 24	Metabolism, trophism, niches. Part 2. (TBD)
4	Jan 31	Intra- and inter-species interactions: Quorum sensing, symbiosis, comensalism, and parasitism. Part 1. (KN)
5	Feb 7	Intra- and inter-species interactions: Quorum sensing, symbiosis, comensalism, and parasitism. Part 2. (TBD)
6	Feb 14	Biofilms vs. the Planktonic Lifestyle. Part 1. (SF)
7	Feb 21	Biofilms vs. the Planktonic Lifestyle. Part 2. (TBD)
8	Feb 28	Generation of genetic diversity: DNA damage, repair, and adaptive mutation. Part 1. (SF)
9	Mar 7	Generation of genetic diversity: DNA damage, repair, and adaptive mutation. Part 2. (TBD)
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10	Mar 21	Extremophiles. Part 1. (KN)
11	Mar 28	Extremophiles. Part 2. (TBD)
12	Apr 4	Model systems to study microbial evolution. Part 1. (SF)
13	Apr 11	Model systems to study microbial evolution. Part 2. (TBD)
14	Apr 18	Mechanisms of horizontal transfer and genetic diversity. Part 1. (SF)
15	Apr 25	Mechanisms of horizontal transfer and genetic diversity. Part 2. (TBD)