BIOSC 1998: Beneficial Microbes
Fall term
Lecture schedule: Tu/Th [time TBD]

Instructor: Dr. Tera Levin, teralevin@pitt.edu

Office hours: [TBD]

Prerequisites: Completion of BIOSC 1850 Microbiology with a grade of C or better

Textbook: REQUIRED: "I Contain Multitudes: The Microbes Within Us and a Grander View of Life", by Ed Yong. Additional reading will be drawn from the primary literature and posted to Canvas.

Course Description: This course is focused on the beneficial roles of microorganisms in a range of natural, medical, agricultural, and/or industrial settings. Students will learn about how microbial communities alter human, animal, and plant biology, as well as the challenges in both creating and maintaining beneficial partnerships. Primary literature will be emphasized.

Course learning objectives
Demonstrate understanding of key factors in beneficial host-microbe interactions, including:

- Principle concepts that define how interactions occur
- The types of relationships that exist between hosts and microbes
- Known mechanisms of interactions
- Forces shaping interactions (and challenges in maintaining mutualisms)
- Modern tools used to investigate interactions

Read and critically evaluate the strengths and weaknesses of scientific papers

- Identify the key question(s) being asked
- Place a research article within the context of the bigger scientific picture.
- Understand the experimental (methods) sections of papers and critically evaluate the results (figures and tables).
- Assess whether conclusions and discussion are justified in light of the data.
- Organize and present data from a scientific paper.

Lecture and Exam Schedule: The schedule for this course is attached. Please note the dates of the mid-term and final examinations to avoid any future scheduling conflicts. Each of the three mid-term exams will be given during the regular class meetings. **The final exam will be [XX date and time].**

Three mid-term exams are scheduled, worth 75 points each. If you take all three mid-term exams, the lowest score will be dropped. If you miss one of the mid-term exams for any reason, this will be designated as the dropped exam. Please be aware that there will be **no make-up mid-term exams**. All students are required to take the final exam, which will include comprehensive problems. Please see the information below on missed exams.

Paper dissections: These assignments will require you to think and describe the articles in your own words. Papers to be dissected will be posted to Canvas. Critiques are due at [XX time] on the discussion days listed on the syllabus unless otherwise noted. While you may discuss the assigned paper(s) with your classmates, and are encouraged to do so, you are expected to turn in your own original work. Copying any text from the papers or the internet (i.e., plagiarism) is not permitted; the first time this occurs, you will receive a warning and an opportunity to resubmit the modified work within 3 days. If a second offense occurs, you will receive a score of zero for the assignment. 10 points/assignment, the top 6 out of 8 will count towards your grade. One or two questions per assignment will be chosen at random for grading. Please submit all assignments through Canvas. Late assignments submitted within 1 week of the original due date are eligible for half-credit.

Participation: Important: You are responsible for carefully reading the papers and book chapters **every week**.
There will be 8 in-class discussions based on current journal articles, as listed in the syllabus, and posted on Canvas. Each student will be randomly selected to informally present 'talking points' with a partner or group to the rest of the class for one in-class discussion. You will be notified that you are presenting at least 1 week before that class period. You are responsible for finding a replacement if you cannot make the day you are assigned. These points cannot be earned outside of class. While everyone is responsible for the content of the posted paper, your presentation will be evaluated as shown:

Expectations for in-class discussion when you present the assigned paper:

- Were you prepared? (Did you read the paper and consider the discussion points?)
- Did you contribute substantive and accurate information?
- Were you able to answer questions from the instructor or audience?
- Did you voluntarily enter class discussion?
- Did you propose additional questions?

Missed Exams: There are no make-up mid-term exams or extra credit opportunities in this course. If you miss one mid-term exam with a valid and documented excuse (circumstances outside your control, such as a medical emergency or death in the family), your score for the missed exam will be calculated based on the average of your other mid-term exam and the final exam. Only one mid-term exam will be excused. If you miss more than one mid-term exam you should discuss the options available to you with your advisor or the DAS Dean's Office. All students must take the final exam. Students who miss the final exam due to an emergency should pursue the G grade option as detailed below. Please note that you are expected to show up to each exam on time. Late arrivals will be given the exam during the time

that remains for the designated examination period. Transportation problems and weather issues are not considered an adequate excuse. If you must travel to reach campus, please allow sufficient time to ensure that you arrive before the exam begins.

Final grade: Your final grade will be determined on the basis of your total points earned for the semester. A total of 325 points are possible using the following criteria:

Criteria	**Total Possible**
Top two mid-term exam scores	150 points
Top six paper dissections	60 points
Participation points	15 points
Cumulative final exam	110 points
Total	335 points

Grades will be based on a traditional grading scale (i.e., 92%+ = A, 90-91% = A-, 88-89% = B+, 82-87% = B, etc.). I may move grade boundaries ("curve") moderately if appropriate. **Any curve will not penalize you compared to the straight grading scale.**

G Grades: If you wish to petition for a G grade, you must submit a request for this grade change in writing, and you must document your reason(s). You will be required to make arrangements for the specific tasks that you must complete to remove the G grade. Remember that G grades, according to DAS guidelines, are to be given only when students who have been attending a course and have been making regular progress are prevented by circumstances beyond their control from completing the course after it is too late to withdraw. If you miss the final exam, you may receive a G grade if the above conditions are met.

Academic Integrity Policy: Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity (http://www.as.pitt.edu/faculty/policy/integrity.html) will be required to participate in the outlined procedural process as initiated by the instructor. Violation of the Academic Integrity Code requires the instructor to submit an Academic Integrity Violation Report to the Dean's Office.

Any attempt to submit work that is not the student's own work is a violation of academic integrity. You may not work with another student (or anyone else) on any graded coursework unless specifically authorized to do so on that assignment. Even in those cases, students are still responsible for doing their own work. Any evidence I find or formal complaints I receive of students colluding on assessed work or free-riding from the work of others will constitute an academic integrity violation.

Turnitin: Students agree that by taking this course all required assignments may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database

solely for the purpose of detecting plagiarism of such papers. Use of Turnitin.com page service is subject to the Usage Policy and Privacy Pledge posted on the Turnitin.com site.

E-mail: Although e-mail will not be used routinely in this class for communication, occasionally I may send out an e-mail notice using the University e-mail addresses available through Canvas. Such notices are also posted as Announcements on Canvas.

Each student is issued a University e-mail address (username@pitt.edu) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of the communications. Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address.

Disability Resources: If you have a disability for which you are, or may be, requesting an accommodation, you are encouraged to contact both the instructor for this course and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890 (phone)/412-624-3346 (fax), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course.

Course Schedule BIOSC 1998 *Beneficial Microbes*
Fall term

Class	Date		Topic*	Chapter‡
Lecture 1	Tu		Course overview and Intro to Beneficial Microbes	Prologue & 1
Lecture 2	Th		The people who thought to look + How to read & present papers	2
Lecture 3	Tu		Body Builders: Microbes impacting behavior and development	3
Lecture 4	Th		Body Builders **[discussion]**	Primary literature
	Fri		*Fall term add/drop period ends*	
Lecture 5	Tu		Body Builders	
Lecture 6	Th		Terms and Conditions Apply: What is a symbiont vs. pathogen?	4
Lecture 7	Tu		Terms and Conditions Apply **[discussion]**	Primary literature
Lecture 8	Th		Terms and Conditions Apply	
Lecture 9	Tu		In Sickness and In Health: Microbes protecting from disease	5
Exam 1	**Th**		**Exam 1 covering lectures 1-8**	
Lecture 10	Tu		In Sickness and In Health **[discussion]**	Primary literature
Lecture 11	Th		In Sickness and In Health	
	Tu		*No class (Monday classes held, no Tuesday classes this week)*	
Lecture 12	Th		The Long Waltz: The evolution of beneficial partnerships	6
Lecture 13	Tu		The Long Waltz **[discussion]**	Primary literature
Lecture 14	Th		The Long Waltz	
Lecture 15	Tu		Mutually Assured Success: Microbes providing nutrients	7
Exam 2	**Th**		**Exam 2 covering lectures 9-14**	
	F		*Last day for monitored withdrawal*	
Lecture 16	Tu		Mutually Assured Success **[discussion]**	Primary literature
Lecture 17	Th		Mutually Assured Success	
Lecture 18	Tu		Allegro in E Major: Gene gains, losses, and transfers	8
Lecture 19	Th		Allegro in E Major **[discussion]**	Primary literature
Lecture 20	Tu		Allegro in E Major	
Lecture 21	Th		Microbes a la Carte: Manipulating microbiomes	9
Lecture 22	Tu		Microbes a la Carte **[discussion]**	Primary literature
	Th		*Thanksgiving*	
Lecture 23	Tu		Microbes a la Carte & Tomorrow the World	10
Exam 3	**Th**		**Exam 3: covering lectures 15-20**	
Lecture 24	Tu		Industrial & food microbiology	

Lecture 25	Th		Industrial & food microbiology **[discussion]**	Primary literature
Final Exam			**Final exam: covering lectures 22-25 and cumulative material**	

**** Topic for each day may be adjusted as we progress through the term, but the dates of the exams will not be altered.***

‡ Chapter assignments are from "I Contain Multitudes" by Ed Yong. Please see the more detailed reading assignments and articles posted on Canvas.