MCB 6937: Microbial Multicellularity (2 credits)
Sections: MMB6 **Class Periods:** Weekly asynchronous online lectures
Location: Online
Academic Term: Summer C (May 15 – Aug 11, 2023)

Instructor:
Name: Kelly C. Rice, Associate Professor, Microbiology and Cell Science
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352-392-1192
Office Hours: Weekly Tuesdays 9 am – 10 am EST or by appointment, on Zoom:
https://ufl.zoom.us/j/95233448272?pwd=dzNnN3JoWVFBQ2gyVkRyenRYQ0d0QT09

Course Description
This 2-credit graduate course covers the genetics and physiology underlying microbial multicellular behavior, with an emphasis on bacterial examples relevant to human health and disease.

Course Delivery
All course content is delivered through the Canvas course website. This course is taught online and consists of a**synchronous lectures and discussion board activities.** Lectures are pre-recorded and posted to our Canvas course website. Live online review meetings will be held on zoom prior to each exam. Attendance to these live online meetings is optional, these meetings will also be recorded and posted to our Canvas course page.
• Students will be informed at the beginning of each class which portion(s) (if any) will be recorded. Students who participate with their camera engaged or utilize a profile image agree to have their video or image recorded.
• If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and should communicate using the "chat" feature, which allows students to type questions and comments live.
• Weekly Zoom office hours and any other one-on-one meetings with students will never be recorded.
• As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Course Pre-Requisites / Co-Requisites
Completion of MCB 5205 or equivalent is recommended prior to taking this course.

Course Objectives
At the end of this course, students should be able to:
1. Describe specific examples of bacterial multicellular/community behavior (quorum sensing, biofilm formation, competence development, fruiting body formation).
2. Understand the altruistic principles of bacterial persister cell formation and fratricide.
3. Relate objectives 1-2 to the ability of bacterial pathogens to cause disease and resist environmental and antibiotic stress.
4. Interpret data and identify key findings presented in peer-reviewed research articles related to objectives 1-3 above.
5. Evaluate the rigor of data presented in peer-reviewed research articles related to objectives 1-4 above.

Materials and Supply Fees -not applicable   **Required Textbooks and Software** -no textbook required

Weekly lecture topics/readings:

Week 1, May 15-19: Introduction to multicellular behavior in bacteria (history of the field, general concepts/examples)
https://ami-journals.onlinelibrary.wiley.com/doi/epdf/10.1111/1462-2920.14005

Week 2, May 22-26: Quorum sensing
https://doi.org/10.1073/pnas.95.12.7046

Week 3, May 29-June 2: Subpopulation behavior I: the persister cell hypothesis
https://doi.org/10.1099/mic.0.001266
https://doi.org/10.1128/JB.186.24.8172-8180.2004

Week 4, June 5-9: Subpopulation behavior II: fratricide/competence development
https://www.nature.com/articles/nrmicro1613
https://doi.org/10.1111/j.1365-2958.2005.05021.x

Week 5, June 12-16: Introduction to biofilms
https://www.nature.com/articles/s41522-021-00251-2

Week 6, June 19 – 23: Review I and Exam 1

Week 7, June 26-30: no class (summer break)

Week 8, July 3-7: Prototype medical biofilm: *Pseudomonas aeruginosa*
https://doi.org/10.1111/j.1365-2958.2005.05008.x

Week 9, July 10-14: Prototype medical biofilm: *Staphylococcus aureus*
https://doi.org/10.4049/jimmunol.1002794

Week 10, July 17-21: Prototype mixed-species medical biofilm: Dental plaque
https://doi.org/10.1073/pnas.1522149113

Week 11, July 24-28: Fruiting body formation
https://doi.org/10.1073/pnas.191384198

Week 12, July 31-Aug 4: Bacterial predation
https://journals.asm.org/doi/10.1128/AEM.02286-19

Week 13, Aug 7-11: Review II and Exam 2

Attendance Policy, Class Expectations, and Make-Up Policy

Written participation in the weekly discussion boards is required (see evaluation of grades below). Excused absences for missed exams must be consistent with university policies in the Graduate Catalog and require appropriate documentation. Attendance and make-up requirements for assignments are consistent with university policies (Attendance Policies).

Evaluation of Grades

Weekly quizzes: There will be 10 weekly online quizzes, based on the weekly lecture material and/or posted readings. Each quiz is worth 10 points and will typically consist of multiple-choice questions. These are open-book quizzes (administered through Canvas) that are meant to help you review the course material and practice for the exams. For study purposes, answers to quiz questions will be available in Canvas following each quiz due date.

➢ CANVAS HINTS for ONLINE QUIZ AND ASSIGNMENT SUBMISSION (provided by UF Computing Help Desk): It is recommended that you take online assessments during Help Desk hours whenever possible. If you have a problem while taking an Assessment, log out and log back in as quickly as possible. If the assessment is timed, the timer will continue to run while you are logged out. If you still encounter difficulties, take a screen shot of the problem (Hit the "Print Scrn" button on your keyboard and paste "CTRL+V" into a program like Word or Paint) so the Help Desk can investigate, and you will have "proof of technical difficulty" of the problem for your Instructor. Call the Help Desk (352-392-4357) immediately. When you submit an Assignment/Assessment you get a confirmation screen that contains a confirmation number. You might want to make a habit of taking a screen shot or printing it for your records. The Assignment/Assessment list will also show this Assignment/Assessment as "submitted" including the date and time of your submission. If you do not get the confirmation screen and your Assignment/Assessment is not listed as "submitted," you have not submitted the Assignment.

Discussion board activities: There will be 10 graded discussion board activities (1 per week); these will be based on assigned weekly readings of peer-reviewed research articles that complement the weekly lecture material. These activities are meant to be interactive, facilitating conversational interaction between students and instructor and focused on critical evaluation of the assigned research article. For some weekly discussions students may be assigned into groups. A rubric for these activities will be provided in Canvas. Each discussion board activity is worth 10 points.

Exams (closed book/proctored): There will be 2 proctored exams throughout the semester (see weekly course schedule), each worth 100 points towards your final course grade. All exams for this course will be administered through Canvas and students will take them online through HonorLock as described below:

Honorlock will proctor your exams this semester. Honorlock is an online proctoring service that allows you to take your exam from the comfort of your home. You DO NOT need to create an account, download software or schedule an appointment in advance. Honorlock is available 24/7 and all that is needed is a computer, a working webcam, an external side-view camera (more details will be provided on Canvas), and a stable Internet connection.

To get started, you will need Google Chrome and to download the Honorlock Chrome Extension. You can download the extension at www.honorlock.com/extension/install. When you are ready to test, log into the LMS, go to your course, and click on your exam. Clicking Launch Proctoring will begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, and complete a scan of your room. Honorlock will be recording your exam session by webcam as well as recording your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it is on a secondary device. Good luck! Honorlock support is available 24/7/365. If you encounter any issues, you may contact us by live chat, phone (844-243-2500), and/or email (support@honorlock.com). If you encounter issues within the LMS, you may contact Your School's Online Support Services team at their number.

Prior to the start of each exam, you will need the following:

- Government issued photo ID (or Student photo ID).

- Working camera and microphone.

- Stable internet connection.

- Google Chrome browser (https://chrome.com).

- During the test: The online testing environment should mimic the 'in class' testing environment, and has the following guidelines:

Testing Area:

- Sit at a clean desk or table (not on a bed or couch)

- Lighting in the room must be bright enough to be considered "daylight" quality. Overhead lighting is preferred; however, if overhead is not possible, the source of light should not be behind the student

- Ensure your desk or table is cleared of all other materials.

- Make sure your laptop is fully charged or keep the charger within arm's reach.

The following items/actions are not permitted:

- No writing visible on desk or on walls.

- No websites other than Canvas and the Honorlock proctoring extension should be used or open while taking a proctored exam.

- Close all other programs and/or windows on the testing computer prior to logging into the proctored test environment.

- Make sure music/televisions are not playing in the background.

- Communication or receiving assistance from others is not permitted during a proctored assessment. Exceptions: contacting Honorlock support or your institution's help desk.

- No other persons except the test-taker should be in the room during testing.

- Using a phone or any other electronic device, other than your test-taking device, is not permitted.

- Remain visible in the web camera during the entire duration of the exam.

- Leaving the room during the testing period is not permitted.

- You must not take the computer into another room to finish testing.

- Headphones or smart watches are not permitted.

- Dual monitors are not permitted.

Honorlock support: 1-(844) 243-2500

- Each exam is designed to be completed in 75 minutes or less. However, the time-limit on each exam will be set at 100 minutes as a buffer in case of any unexpected technical difficulties with Honorlock.

- If you are unable to take an exam because of a technical glitch on your end (computer broken, poor internet connectivity), that is your responsibility and does not constitute an excused absence for an exam.

- For additional questions, please review the Honorlock Student Handout (available under Modules on Canvas course website).

- The dates and window for completing each exam is specified in the weekly course schedule (last page of syllabus).

- Make sure you sign-up for the correct exam course number – MCB5205 + your section number.

- The rules and format for each Exam will be reviewed prior to each exam period. Materials such as cell phones, scratch paper, books, notes, calculators, etc. are NEVER allowed during the exam.

- Exam videos will be reviewed by the course instructor and/or TA to verify that academic integrity of your exam has not been breached.

Assignment	Total Points	Percentage of Final Grade
Weekly quizzes (10 x 10 points)	100	25%
Weekly journal club discussion (10 x 10 points)	100	25%

Exam 1	100	25%	
Exam 2	100	25%	
	400	100%	

Grading Policy

Percent	*Grade*	*Grade Points*
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33
81.0 – 83.9	B	3.00
78.0 - 80.9	B-	2.67
75.0 - 79.9	C+	2.33
72.0 – 74.9	C	2.00
69.0 - 71.9	C-	1.67
66.0 - 68.9	D+	1.33
63.0 - 65.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
UF Graduate Catalog
Grades and Grading Policies

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Click here for guidance on how to give feedback in a professional and respectful manner. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students here.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the Notification to Students of FERPA Rights.

Campus Resources:

Health and Wellness

U Matter, We Care:
If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or police.ufl.edu.

Academic

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling.

Library Support, Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints Campus

On-Line Students Complaints