CALS Curriculum Committee Meeting
January 21, 2022
1:00 p.m.

Via Zoom: https://ufl.zoom.us/j/355458614
Meeting ID : 355458614

Members: S. Ahn, J. Brendemuhl, D. Coenen, K. Fogarty, M. Dvorak, D. Gabriel, V. Hull, P. Inglett, J. Larkin (Chair), L. Lietzenmayer, L. Lundy, T. Martin, G. Nunez, B. Pearson, C. Prince, J. Scheffler, M. Sharp, A. Watson, J. Weeks, A. Wysocki

Agenda and Index for Materials

Approve Minutes from December 17, 2021 meeting

Dr. Brendemuhl: Update from UCC

Undergraduate Course Change Proposal

1. WIS 4501 – Introduction to Wildlife Population Ecology (req. #16870)

Curriculum

2. Proposed new concentration in Online MS Microbiology and Cell Science program – Microbiome in Health & Disease (req. #16937)

3. Proposed change of required course in MS Microbiology and Cell Science program (req. #16832)

4. Proposed addition of the Management and Sales in Agribusiness to UF Online (req. #16867)

Discussion

5. Credits exclusive to minors. Can approved advisor/department electives count as exclusive. Continue discussion.

CALS Curriculum Committee Meeting
December 17, 2021
Submitted by James Fant

Members Present: J. Brendemuhl, D. Coenen, M. Dvorak, D. Gabriel, V. Hull, P. Inglett, J. Larkin, L. Lietzenmayer, L. Lundy, T. Martin, G. Nunez, B. Pearson, C. Prince, J. Scheffler,

Substitute: Dale Pracht for K. Fogarty

Visitors: Lee Burton, Tre Easterly, Susan Underkoffler

Call to Order: The College of Agricultural and Life Sciences Curriculum Committee met via Zoom on December 17, 2021. Dr. Larkin called the meeting to order at 1:03 p.m.

Previous agenda items and supporting material can be found on the CALS College Committees homepage under document archives: https://cals.ufl.edu/faculty-staff/committees/

Approval of Minutes: A motion was made by Maddie Dvorak to approve the minutes from the November 19, 2021, meeting of the CALS CC. The motion was approved.

All items approved by the committee will be forwarded to either the Graduate Curriculum Committee (GCC), Graduate Council (GC) or the University Curriculum Committee (UCC) once any changes requested are made and the submission is complete.

Links: Grades – https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/
For Graduate Grades: https://catalog.ufl.edu/graduate/regulations/#text
Syllabus Statements – https://cals.ufl.edu/content/PDF/Faculty_Staff/CALS-Syllabus-Policy.pdf
Absences & Make-Ups – https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx
Writing Learning Objectives - https://cals.ufl.edu/content/PDF/Faculty_Staff/cals-course-objectives.pdf.

Update from UCC:

1) Here are the items that were approved at the 12/14/21 UCC meeting.
    a. Proposed revision to writing requirement placement within the AEC-CLD specialization 8-semester plan
2) These items were conditionally approved at the 12/14/21 UCC meeting.
    a. Proposed change to the Common Prerequisite Manual for AOM
3) These items were recycled at the 12/14/21 UCC meeting.
    a. Proposed change to UT for AOM
    b. Proposed curriculum change to AOM
4) Other notes.
    a. Faculty Senate approved the proposed changes to the 2024-2025 Academic Calendar.
    b. February 9, 2022, will be a Day of Gratitude – Classes will be held for students
    c. Name change for SWS was approved by the Faculty Senate

Undergraduate Course Change Proposals

1. AEC 4200 – Teaching Methods in Agricultural Education (req. #16616)

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. This item was reviewed with items #2 and #3. A motion was made by Dr. Coenen to approve these items with edits required. The motion was approved. Changes should be made to all items unless specified otherwise. Demonstrate needs to be replaced as a learning verb in objectives section of item #1. Under the course information section in the syllabus for item #2 AEE 4224 needs to be changed to AEC 4224 (description and prerequisites). For items #1 and #3 the first page of the proposed syllabus should follow the second page. All course information needs to be on the first page. Under the time and location section in the syllabus for item #3 lap needs to be changed to lab.

2. AEC 4224 – Special Methods in Teaching Agricultural Education (req. #16615)

See item #1

3. AEC 4228 – Laboratory Practices in Teaching Agricultural Education (req. #16614)

See item #1

4. WIS 4501 – Introduction to Wildlife Population Ecology (req. # 16799)

A motion was made by Dr. Inglett to deny this item and request resubmission using the correct UCC form. The motion was approved. The item has been resubmitted.

Recycled

5. WIS 6XXX – Avian Communications (req. #16557)

Please be sure to make all requested changes to both the UCC form and syllabus if necessary. A motion was made by Dr. Nunez to approve this item with changes required. The motion was approved. Make sure the proposed course title matches throughout the submission. Bird Language is the title on the proposed syllabus. The syllabus must include potential office hours even if meetings are by appointment. In the points breakdown section of the syllabus the percentages listed exceed 100%. In the grades section a percentage point needs to be added to 0-599 at the bottom of the percent column. Include spring break in the proposed course schedule. Many of the links included in the syllabus are old. Check all links and update as necessary.

Discussion items

6. Credits exclusive to minors. Can approved advisor/department electives count as exclusive? Continue discussion.

This item was tabled by Dr. Brendemuhl.

7. Combined BS-MS Degrees

Changes will be coming sometime in February.

The meeting was adjourned at **2:13** p.m.

Cover Sheet: Request 16870

WIS 4501 - Prereq Change

Info

Process	Course|Modify|Ugrad/Pro
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Kelley Graff kelleygraff@ufl.edu
Created	12/16/2021 8:58:34 AM
Updated	12/16/2021 10:39:31 PM
Description of request	Updating request to modify this course. Previously submitted incorrectly as a new course.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Wildlife Ecology and Conservation 60470000	Eric Hellgren		12/16/2021
WIS 4501 Syllabus.pdf CALS Curriculum Committee Submission Checklist.pdf					12/16/2021 12/16/2021
College	Pending	CALS - College of Agricultural and Life Sciences			12/16/2021
No document changes					
University Curriculum Committee					
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Catalog					
No document changes					
Student Academic Support System					
No document changes					
College Notified					
No document changes					

Course|Modify for request 16870

Info

Request: WIS 4501 - Prereq Change
Description of request: Updating request to modify this course. Previously submitted incorrectly as a new course.
Submitter: Kelley Graff kelleygraff@ufl.edu
Created: 12/16/2021 8:48:04 AM
Form version: 1

Responses

Current Prefix WIS
Course Level 4
Number 501
Lab Code None
Course Title Introduction to Wildlife Population Ecology
Effective Term Spring
Effective Year 2022
Requested Action Other (selecting this option opens additional form fields below)
Change Course Prefix? No

Change Course Level? No

Change Course Number? No

Change Lab Code? No

Change Course Title? No

Change Transcript Title? No

Change Credit Hours? No

Change Variable Credit? No

Change S/U Only? No

Change Contact Type? No

Course Type Lecture

Change Rotating Topic Designation? No

Change Repeatable Credit? No

Change Course Description? No

Change Prerequisites? Yes
Current Prerequisites PCB 3034C & WIS 3401 & FOR 3153C or PCB 3601C or PCB 4044C
Proposed Prerequisites PCB 3063 or WIS 3553C & WIS 3401 & FOR 3153C or PCB 3601C or PCB 4043C or WIS 3404
Change Co-requisites? No

Rationale PCB 3034C is no longer taught. Changing genetics requirement to PCB 3063 or WIS 3553 to reflect this change.
Adding WIS 3404 Natural Resource Ecology as a general ecology option to the current list of three classes
Changing PCB 4044C to PCB 4043C. This is the number for this course.

CALS Curriculum Committee
Submission Checklist

NOTE: This checklist must be included with all course and certificate submissions.

The checklist below is intended to facilitate course and certificate submissions to the University of Florida Academic Approval Tracking System (https://approval.ufl.edu/). The checklist consists of the most common items that can cause a submission to require changes or be recycled. Contrary to information provided on the UF approval site, the CALS Curriculum Committee requires a syllabus be submitted with each new course or course modification request. Please note that submitters are encouraged to attend the CALS CC meeting at which their item is being reviewed. This allows the submitter to answer any potential questions that may arise that could cause the item to not be approved. Also, be aware that when completing the UCC form the section Description of Request is asking for a brief statement about what you are doing. This is **not** the place for a course description. A statement such as "Proposal of a new undergraduate course" is all that is needed. Please do not submit documents in pdf format. All documents should be submitted in Word to facilitate editing on our end if necessary.

CHECKLIST: PLEASE INITIAL OR MARK N/A FOR EACH STATEMENT TO INDICATE YOUR COMPLIANCE.

KG It is required when making a submission that you consult your department's representative to the CALS CC. A list of current members can be found on the committee site located at: https://cals.ufl.edu/faculty-staff/committees/.

KG You MUST comply with the CALS Syllabus Policy, including items 1 through 8 and all standard syllabus statements. This document can be viewed at the committee site(https://cals.ufl.edu/faculty-staff/committees/) by clicking on the Curriculum Committee – Information & Documents heading and scrolling down to Forms, Checklists, and Other documents. The other items included here are all very helpful when making a curriculum submission. Some will be mentioned in other checklist items below.

N/A Submission of a course modification requires both the current version of the course syllabus and the proposed version.

N/A Joint course submissions must include 1.) both graduate and undergraduate syllabuses and 2.) a separate document outlining the substantial (more than one) differences in assignments between the two courses. These assignments must account for at least a 15% difference in graded material between the two levels. If this is a new course submission both courses must be submitted for approval simultaneously.

KG The course description on the UCC form and in the syllabus must match. Any other information you wish to include needs to be under a different heading such as background or additional information.

KG The course learning objectives must be consistent with Bloom's taxonomy. Please see the following link at the CALS Curriculum site. (https://cals.ufl.edu/content/PDF/Faculty_Staff/cals-course-objectives.pdf). Do not use the words demonstrate or understand when listing learning objectives.

KG The course schedule should be concise and include the appropriate number of weeks in the semester.

N/A All graduate course submissions must include a reading list if a textbook is not required. The reading list should include at least some current readings (within the last 5 years). All readings do not need to be current.

N/A Outside consultations are required if there is a possibility of the proposed course covering material taught in another department or college on campus. There must be a consult form completed by the chair of the department from who you are seeking the consult. Instructors may provide additional consults. The form can be found at: https://approval.ufl.edu/policies/external-consultations/.

KG Prerequisite courses are required for 3000 and 4000 level courses. This line of the approval form cannot be "none" or left blank. Junior or senior standing is an acceptable option. A phrase such as "a course in basic biology" is not acceptable.

KG Decimal points must be included in the grading scale if grade cut-offs are based on percentages. While this is not a university policy it is a CALS standard practice to avoid any confusion when final grades for the course are determined.

KG The attendance and make-up policy in a syllabus cannot contradict the university's policy. Do not include any additional wording to this policy. A statement and link regarding this is included in the CALS Syllabus Statements. For the approval process the college suggests a less is more view when it comes to this policy.

KG The most recent version of the CALS Syllabus Statements boiler plate must be included in all syllabuses. This document is included in the CALS Syllabus Policy and can be copied and pasted to the syllabus. Do not use the boilerplate statements from an old syllabus as they are likely to be out of date.

Certificates

If proposing a new undergraduate or graduate level certificate that includes any courses outside of the submitters department a statement regarding any possible impact on those courses needs to be included. An email from the instructor is acceptable. Also, any courses required for the certificate must have permanent prefixes and course numbers. The submission must include intended catalog copy. (Contact Dr. Joel Brendemuhl (brendj@ufl.edu) for further instruction)

Introduction to Wildlife Population Ecology (WIS 4501)

Miguel A. Acevedo
TA:

Miguel's E-mail: maacevedo@ufl.edu
Miguel's Office Hours:
Miguel's Office: Bld 866 ("White House"), O 0111
Class Hours: MWF, period 6

This syllabus is a broad description of course objectives and plan of work; it is subject to change.

1. **Codification**: WIS 4501
2. **Credits**: 3 crds
3. **Pre-requirements**:
4. **Course Description**: How does the human population size changes over time? What are the temporal patterns of influenza in the USA? What are the drivers of boom and bust pest cycles? What will be the predicted outcome of various management strategies? How much can we fish without compromising future fish stocks? The answers to these questions belong to the field of *population ecology*—the study of how population size varies in space and time. Once we understand the patterns and mechanisms behind this temporal variation in abundance we can ultimately explain and predict species distributions. In this course, you will get introduced to the fundamental concepts of population ecology. Because populations are complex and difficult to quantify we will use an array of models to fulfill our goal.
5. **Course Objectives**: At the completion of this course, students will be able to:
   (a) Recognize, compare and contrast concepts and vocabulary related to population ecology applied to wildlife ecology and conservation.
   (b) Describe the key definitions in population ecology
   (c) Interpret models that describe population size change through time
   (d) Apply population ecology models to answer questions in wildlife ecology, conservation and management
6. **Tentative Course Outline**:

   The weekly coverage might change as it depends on the progress of the class. The class is divided into nine sections. I: introduction, II: unstructured population growth models,

III: structured population growth models, IV: metapopulation dynamics, V: population viability analysis, VI: species interactions, VII: wildlife harvest, VIII: population cycles and regulation, and IX: life history. Readings are optional but highly recommended.

Week	Content
Section I	
Week 1	• **Lecture M**: Class Introduction • **Lecture W**: Why study population ecology? • **Lab F**: Remembering `R` and loops (R-lab 1)
Section II	
Week 2	• **Lecture M**: Density independent models (exponential growth) I • **Lecture W**: Density independent models (exponential growth) II • **Lab F**: Density independent models • Read: Gotelli (Ch 1), Rockwood (Ch 1)
Week 3	• **Lecture W**: Density dependent models • **Lab F**: Density dependent models • Read: Gotelli (Ch 2), Rockwood (Ch 2)
Section III	
Week 4	• **Lecture M**: Life table analysis • **Lecture W**: Life table analysis II • **Lab F**: Life table analysis (R-lab 3) • Read: Gotelli (Ch 3), Rockwood (Ch 4)
Week 5	• **Lecture M**: Matrix algebra • **Lecture W**: Structured population models I • **Lab F**: Structured population models I • Read: Gotelli (Ch 3), Rockwood (Ch 4)
Week 6	• **Lecture M**: Structured population models II • **Lecture W**: Structured population models III • **Lab F**: Structure Population models II • Read: Gotelli (Ch3), Rockwood (Ch4)
Section III, IV	
Week 7	• **Lecture M**: Work on exam • **Lecture W**: Metapopulation models I • **Lab F**: No Lab • Read: Gotelli (Ch4), Rockwood (Ch5)
Week 8	• **Lecture M**: Metapopulation models II • **Lecture W**: Metapopulation models III • **Lab F**: Metapopulation models • Read: Hanski 1999 (Ch 4, 5)
Section V	

Week 9	• **Lecture M**: Population viability analysis I • **Lecture W**: Population viability analysis II • **Lab F**: PVA • Read: Rockwood (Ch1)
Section VI Week 10	• **Lecture M**: Competition • **Lecture W**: Predator-prey • **Lab F**: Lotka-Volterra • Read: Gotelli (Ch 5,6), Rockwood (Ch 7, 10)
Week 11	• **Lecture M**: Disease models I • **Lecture W**: Disease models II • **Lab F**: Disease models • Read: Keeling and Rohani 2011 (Ch 2)
Section VII Week 12	• **Lecture M**: Exam review • **Lecture W**: Work on exam 2 • **Lab F**: Wildlife Harvest (Lecture) • Read: Leopold (Ch 9)
Section VIII Week 13	• **Lecture M**: Wildlife Harvest/Population cycles • **Lecture W**: Population cycles • **Lab F**:Population cycles (Paper discussion: Krebs et al. 1996) • Read: Kendall et al. 1999
Week 14	• **Lecture M**: Online lecture
Section IX Week 15	• **Lecture M**: Life history • **Lecture W**: Disease models (COVID19) • **LAB F**: COVID19 paper discussion • Read: Rockwood (Ch 6)
Week 16	• **Lecture M**: Miguel's Research • **Lecture W**: Class review • Read: Rockwood (Ch 6)

7. **Educational Strategies**: We follow an active learning framework that include inquire-based lectures, analysis of the primary literature, computer exercises, group projects and group discussions

8. **Minimum resources available**: Lecture room, Computer lab, audio-visual equipment.

9. **Evaluation strategies**:

Quizzes	10%
Lab prep	30%
Group exercises	20%
Exams	40%

Every week there will be a quiz (formative assessment) due on Fridays before 11pm. Labs will have two evaluations: a *prep* and a *group project*. A prep consists of an R worksheet or a paper designed to give you the necessary skills to conduct the group project in the lab. Each prep will have a quiz that is due Thursdays before 11pm. Group project reports are due on the Monday following the lab before noon.

10. **Grading**:

>= 93.00 %	A	90.00–92.99	A-
87.00–89.99	B+	83.00–86.99	B
80.00–82.99	B-	77.00–79.99	C+
73.00–76.99	C	70.00–72.99	C-
67.00–69.99	D+	63.00–66.99	D
60.00–62.99	D-	< 59.99	E

Information on current UF grading policies is available at https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx.

11. **Textbook**: There are no book requirements for this course. However, Gotelli's "A primer of Ecology" is highly recommended for students that want to complement lecture materials. A course packet will be available electronically via CANVAS that contains required weekly readings, lecture, and lab information.

    Lectures will be based on the following resources:

    Gotelli, N. J. (2001). A primer of ecology. Sunderland, MA: Sinauer Associates.

    Hanski, I. (1999). Metapopulation ecology. Oxford University Press.

    Kendall, B. E., Briggs, C. J., Murdoch, W. W., Turchin, P., Ellner, S. P., McCauley, E., ... & Wood, S. N. (1999). Why do populations cycle? A synthesis of statistical and mechanistic modeling approaches. Ecology, 80(6), 1789-1805.

    Kingsland, S. E., & Kingsland, S. E. (1995). Modeling nature. University of Chicago Press.

    Leopold, B. (2019). Theory of Wildlife Population Ecology. Waveland Press.

    Rockwood, L. L. (2015). Introduction to population ecology. John Wiley & Sons.

12. **Class attendance and demeanor policy**: All students are expected to attend every class and lab sessions. Students are responsible for the materials and information presented. Students who miss class for a UF approved reason (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) will be able to make-up exams and quizzes from that day. Unexcused late assignments will have 10% of the point total for that assignment deducted for each day late. Late assignments will not be accepted beyond 3 days post-due date. A professional attitude is expected in all lectures and labs. Please do not disturb your fellow students by talking during class. Please minimize electronic distractions

by silencing cell phones. While we will actively use computer resources in class and lab, it is strongly recommended that students focus on course material and minimize distractions from e-mail and social networking sites. Make-up exams or assignment/homework/quiz problems will not be given for unexcused absences. An acceptable excuse (meeting guidelines from the UF handbook) must be submitted to be eligible for a make-up exam.

13. **Rights of students with special needs**: The University of Florida meets all federal and state laws regarding discrimination including the American Disabilities Act (ADA Law). Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, http://www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

14. **Student evaluations**: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

15. **Academic honesty**: As a result of completing the registration form at the University of Florida, every student has signed the following statement: "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 (http://www.dso.ufl.edu/sccr/process/student-conduct-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."

16. **UF counseling services**: The University of Florida provides excellent resources on campus for students having personal problems or seeking additional career and academic assistance to help them realize their full potential. The University cares about you and your well-being. These resources include:

    (a) 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.

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

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

    (d) University Police Department, 392-1111 (or 9-1-1 for emergencies).
    http://www.police.ufl.edu/

17. **Academic Resources**

    (a) E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
    https://lss.at.ufl.edu/help.shtml.

    (b) Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling.
    http://www.crc.ufl.edu/

    (c) Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

    (d) Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring .http://teachingcenter.ufl.edu/

    (e) Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. http://writing.ufl.edu/writing-studio/

    (f) Student Complaints On-Campus:
    https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

    (g) On-Line Students Complaints: http://distance.ufl.edu/student-complaint-process/

18. **Software use**: All faculty, staff and students of the University are required 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.

19. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

20. In response to COVID-19, the following practices are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones.

    - If you are not vaccinated, get vaccinated. Vaccines are readily available at no cost and have been demonstrated to be safe and effective against the COVID-19 virus. Visit this link for details on where to get your shot, including options that do not require an appointment: https://coronavirus.ufhealth.org/vaccinations/vaccine-availability/. Students who receive the first dose of the vaccine somewhere off-campus and/or outside of Gainesville can still receive their second dose on campus.
    - You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated. Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators. Sanitizing supplies are available in the classroom if you wish

to wipe down your desks prior to sitting down and at the end of the class. Hand sanitizing stations will be located in every classroom.

- If you sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus. UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the UF Health Screen, Test & Protect website for more information. Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work.
- If you are withheld from campus by the Department of Health through Screen, Test & Protect you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- Continue to regularly visit coronavirus.UFHealth.org and coronavirus.ufl.edu for up-to-date information about COVID-19 and vaccination.

Cover Sheet: Request 16937

New concentration request

Info

Process	Concentration|New/Modify/Close|Grad/Interdisciplinary
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Graciela Lorca glorca@ufl.edu
Created	1/11/2022 11:50:52 AM
Updated	1/18/2022 8:18:37 AM
Description of request	We request the approval of a new concentration in Microbiome in Health & Disease within our current Online Master of Science Microbiology and Cell Science

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Microbiology and Cell Science 60100000	Eric Triplett		1/11/2022
MCS Master Microbiome in Health and Disease_Final.pdf Foundational.pdf Electives.pdf					1/11/2022 1/11/2022 1/11/2022
College	Pending	CALS - College of Agricultural and Life Sciences			1/11/2022
No document changes					
Graduate Council					
No document changes					
Graduate School Notified					
No document changes					
Office of the Registrar					
No document changes					
College Notified					
No document changes					

Concentration|New for request 16937

Info

Request: New concentration request
Description of request: We request the approval of a new concentration in Microbiome in Health & Disease within our current Online Master of Science Microbiology and Cell Science
Submitter: Graciela Lorca glorca@ufl.edu
Created: 1/11/2022 11:42:08 AM
Form version: 1

Responses

Proposed Action Create a Concentration
Degree Level M - Master's Degree
Thesis or Non-Thesis Non-Thesis
Concentration Name Online Master of Science Microbiology and Cell Science with a concentration in Microbiome in Health & Disease
Credits 30
Effective Term Earliest Available
Effective Year Earliest Available
Students 150
Percentage of Credits Available Fully Online 100%
Percentage of Credits Available Off-Campus 50% or more
Is this an additional (secondary) concentration? Yes
All Department/Degree/Majors Adding Concentration Microbiology and Cell Science: Online Master of Science Microbiology and Cell Science
Rationale for Proposed Concentration This concentration aims to provide students with knowledge in the emerging area of the microbiome and their contributions to human health. Recently, the field of Microbiome has become a driver in key areas of research, such as health homeostasis, disease onset and progression as well as their use as therapeutics.
This MS would be available to our online Microbiome in Health & Disease Certificate as well Environmental microbiology Certificate students as a self-funded program and as online MS for our on-campus students. This program is unique and would build on our department's research expertise and therefore content would not overlap with other certificates at UF.
Impacts on Other Programs All the classes proposed for this concentration are available in our Department so we don't expect any impact on other Departments.

Applications and Technologies of Synthetic Biology
MCB 6937, Fall-2021

Instructor

Dr. Christopher Reisch - creisch@ufl.edu
Microbiology and Cell and Science, Office – MCS 1152

Preferred methods for communication with the instructor regarding the course is through email.

Please resolve technical issues by contacting the UF helpdesk (e.g. http://helpdesk.ufl.edu; (352) 392-HELP (4357); *helpdesk*@ufl.edu · HUB 132).

Delivery Method/Meeting time

Online - asynchronous

Credits

3-Credit hours

Course Description

This course will introduce the concept of synthetic biology, which is loosely defined as the construction and reconstruction of biological systems, and its practical applications in research and industry. Advanced molecular biology tools for DNA assembly, the construction of biological pathways and circuits, genome editing, and strategies for transcriptional control will be examined in the course.

Course Objectives/Goals/Learning Outcomes

Students enrolled in this course will be able to:

1. Define synthetic biology and understand its importance in the 21st century.
2. Classify and analyze biological parts and their function on the systems level.
3. Describe and discuss advanced molecular biology techniques that facilitate the building of biological parts and systems.
4. Argue both sides of ethical decisions and containment strategies in synthetic biology
5. Demonstrate the ability to critically evaluate current literature in the field.
6. Rationally design experiments to investigate problems in synthetic biology and related fields.

Prerequisites

MCB 3020 or 3023 (or equivalent)

Course Material and Assignments

All required course materials will be available through the Canvas e-Learning site (http://elearning.ufl.edu/). Instructions for and submission of assignments will also be through Canvas.

Required Textbooks

There is no required textbook.
Required reading materials will be posted to Canvas.

Weekly Course Schedule

Date (week)	Topic	Readings
1	Introduction to Synthetic Biology, Molecular Biology, and Biochemistry	Foundations for engineering biology Endy, D. (2005). Nature, 438(7067), 449–453. A brief history of synthetic biology Cameron, D. E., Bashor, C. J., & Collins, J. J. (2014). Nature Reviews Microbiology, 12(5), 381–390.
2 - 3	Biological Parts – Promoters, Regulators, Genes, Terminators, Proteins	Design, construction and characterization of a set of insulated bacterial promoters Davis, J. H., Rubin, A. J., & Sauer, R. T. (2011). Nucleic Acids Research, 39(3), 1131–1141. Automated design of synthetic ribosome binding sites to control protein expression http://www.nature.com/nbt/journal/v27/n10/full/nbt.1568.html Salis, H. M., Mirsky, E. A., & Voigt, C. A. (2009). Nature Biotechnology, 27(10), 946–950.
4	Controlling Gene Expression and Protein Production,	Independent and tight regulation of transcriptional units in Escherichia coli via the LacR/O, the TetR/O and AraC/I1-I2 regulatory elements. 1997. R Lutz and H Bujard, Nucleic Acids Res. 25(6): 1203–1210.
5	Artificial Gene Circuits, Noise in Gene Expression, **Test 1**	Construction of a genetic toggle switch in Escherichia coli Collins, J. J., Gardner, T. S., & Cantor, C. R. (2000). Nature, 403(6767), 339–342.
6	BioSensors – Construction and Application	Synthetic biology devices for in vitro and in vivo diagnostics Slomovic, S., Pardee, K., & Collins, J. J. (2015). PNAS 112(47), 14429–14435. https://doi.org/10.1073/pnas.1508521112
7	Recombinant DNA technologies, Cloning techniques and strategies	Polymerase Chain Reaction https://en.wikipedia.org/wiki/Polymerase_chain_reaction The SLIC, Gibson, CPEC and SLiCE assembly methods (and GeneArt® Seamless, In-Fusion® Cloning) https://j5.jbei.org/j5manual/pages/22.html

		Enzymatic assembly of DNA molecules up to several hundred kilobases Gibson, D. G., Young, L., Chuang, R.-Y., Venter, J. C., Hutchison, C. A., & Smith, H. O. (2009). Nature Methods, 6(5), 343–345.
8 - 9	Genome Editing - Transposons, Recombinases, Zinc Fingers, TALEN's, CRISPR/Cas9	ZFN, TALEN, and CRISPR/Cas-based methods for genome engineering Gaj, T., Gersbach, C. A., & Barbas, C. F. (2013). ZFN, TALEN, and CRISPR/Cas-based methods for genome engineering. Trends in Biotechnology, 31(7), 397–405.
10	DNA synthesis and Assembly, **Test 2**	Large-scale de novo DNA synthesis: technologies and applications Kosuri, S., & Church, G. M. (2014). Large-scale de novo DNA synthesis: technologies and applications. Nature Methods, 11(5), 499–507.
11	Metabolic Engineering – Techniques and Applications,	Metabolic evolution of energy-conserving pathways for succinate production in Escherichia coli http://www.pnas.org/content/106/48/20180.full Zhang, X., Jantama, K., Moore, J. C., Jarboe, L. R., Shanmugam, K. T., & Ingram, L. O. (2009). PNAS 106(48), 20180–5. Production of the antimalarial drug precursor artemisinic acid in engineered yeast Ro, D.-K., Paradise, E. M., Ouellet, M., Fisher, K. J., Newman, K. L., Ndungu, J. M., … Keasling, J. D. (2006). Nature, 440(7086), 940–943.
12	Accelerated Evolution Systems - MAGE, PACE,	A system for the continuous directed evolution of biomolecules Esvelt, K. M., Carlson, J. C., & Liu, D. R. (2011). Nature, 472(7344), 499–503.
13	Synthetic Cells - Recoded *E. coli* and JCVIsyn1-3.0	Genomically Recoded Organisms Expand Biological Functions Lajoie, M. J., Rovner, A. J., Goodman, D. B., Aerni, H.-R., Haimovich, A. D., Kuznetsov, G., … Isaacs, F. J. (2013). Genomically Recoded Organisms Expand Biological Functions. Science, 342(6156), 357–360. Design, synthesis, and testing toward a 57-codon genome Ostrov, N., Landon, M., Guell, M., Kuznetsov, G., Teramoto, J., Cervantes, N., … Church, G. M. (2016). Science, 353(6301), 819–822.
14-15	Containment strategies, Ethical considerations	Biocontainment of genetically modified organisms by synthetic protein design Mandell, D. J., Lajoie, M. J., Mee, M. T., Takeuchi, R., Kuznetsov, G., Norville, J. E., … Church, G. M. (2015). Nature, 518(7537)

Exam Dates/Calendar/Critical dates and deadlines

Week 5 – Test 1
Week 6 – Proposal Abstracts Due
Week 9 – Proposal Outline Due
Week 10 – Test 2
Week 11 – Manuscript Presentation Due
Week 14 – Proposal Due
Week 15 – Test 3

Exam Administration - Honorlock

All exams will be administered through Honorlock using Canvas in E-learning with students using personal computers. The exam may be taken at any location approved by Honorlock during the scheduled exam window on Canvas. Appointments are not needed with Honorlock.

Evaluation of Learning/Grades

3 Exams (100 pts each) –	300 points
Discussion, Quizzes, Homework –	150 points
Quizzes –	80 points
Homework –	70 points
Manuscript Presentation –	100 points
Written Proposal –	100 points

Exams
There will be three exams administered throughout the semester at approximately 5 week intervals. All material covered during class will be subject to testing. Tests are conceptually cumulative because understanding topics covered early in the course will be required to understand materials covered later in the course.
Exams will be composed of multiple-choice, fill-in-the-blank, and essay questions. There will be three essay questions from each module covered, and you will be required to answer all three.

Discussion, Quizzes, Homework
Quizzes – There will be a non-proctored quiz at the end of each module. The quizzes are intended to help you find out how well you know the material.
Discussion groups (no points) – The purpose of the discussion group is to encourage student-student interaction and peer learning. Students are free to ask and answer questions on the discussion group. I will moderate the responses and also pose questions to facilitate the discussion. Discussion boards will not be graded this semester, but I strongly encourage everyone to use the boards.

Homework – Occasionally there will be homework assignments that will be exercises based on material we have learned. For example, you will be asked to design a plasmid and describe its function.

Presentation
Each student will present a manuscript from the primary literature that was published within the last 5 years. The presentation will be 10-15 minutes in length and must adequately describe the methods and results conveyed in at least three figures from the manuscript or its supplemental data. Each presentation will be reviewed by two of your peers. Grades will be assigned based on the input of your classmates and my own review.

Proposals
Each student will be responsible for writing a research proposal that aims to investigate a novel idea in the field of synthetic biology that is of scientific or industrial interest. The proposal should be 6-8 pages single spaced. A brief rubric of the proposal is provided below.
Introduction (2 pages) **–** Clearly provide relevant background information in the context of research that has previously been performed in synthetic biology and fields related to your topic. At least 10 sources of primary literature must be cited (~2 pages).
Significance and Novelty (1-2 pages) – Identify the gap in knowledge that your proposal will address. Explain why this work is important to the field. What are the benefits to science and society that will result from successful completion of this work? Demonstrate that you have a deep understanding of the subject matter and its greater implications. Cite the primary literature and reviews as necessary.
Experimental Plan (3-5 pages) – Provide 3 hypothesis driven research aims that will be used to address the gap in knowledge identified above. Describe a logical workflow that will be used to investigate each aim. The purpose of the experiments should be clear, but the exact experimental conditions do not need to be provided.

Grading Policy

Final letter grades will be assigned based on the number of points earned, as follows:
A = 92-100%, A- = 90-91%
B+ = 88-89%, B = 83-87%, B- =80-82%
C+ = 78-79%, C = 73-77%, C- = 70-72%
D+ = 68-69%, D = 63-67%, D- = 60-62%
F = <60%

More information on grades and grading policies is here:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Class Attendance and Make-Up Policy

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Services for Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation - 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,* **www.counseling.ufl.edu**
  - Counseling Services
  - Groups and Workshops
  - Outreach and Consultation
  - Self-Help Library
  - Wellness Coaching
- U Matter We Care, **www.umatter.ufl.edu/**
- *Career Connections Center,* First Floor JWRU, 392-1601, https://career.ufl.edu/.

Academic Resources

- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.
- Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://www.crc.ufl.edu/
- Library Support, http://cms.uflib.ufl.edu/ask. 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. http://teachingcenter.ufl.edu/
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. http://writing.ufl.edu/writing-studio/

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. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

University Honesty Policy

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*" You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Additional comments regarding academic integrity:
Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

- Have another person complete a quiz in this course

- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

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.

Microsoft Office 365 Software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

The University of Florida and most instructors believe strongly in the ability of students to express concerns regarding their experiences at the University. Most problems, questions and concerns about courses can be resolved by professionally communicating with the instructor. Please try to meet your instructor in person, make an appointment to call, or try to set up a remote meeting through Skype or other media.

If this does not help the University encourages the students who wish to file a written complaint to submit that complaint directly to the department that manages that course. If a problem really persists and cannot be resolved by communicating with the instructor and the department, contact… for

Residential Course: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

Online Course: http://www.distance.ufl.edu/student-complaint-process

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions may be delayed.

If a student is lacking professionalism repeatedly, the instructor has the rights to file formal complaint against the student through the Dean of Student office.

MCB 6940 Professional and Career Development in Microbiology and Cell Science (1 credits) - Summer 2021

Instructor Contact Information

Dr. Bryan Korithoski (bkorithoski@ufl.edu)

Office location: MCB room 1047, Museum Road

Meeting time

WEB

Course Overview

This course is designed to aid students making career decisions and organizing their supporting academic credentials. The class is taught as a lecture/presentation and discussion/activity course emphasizing the wide variety of career opportunities in professional schools, academia, industry and alternative professions for (micro)-biology majors. Students receive personalized career development feedback from a variety of successful scientists, which will prepare students for successful and rewarding future careers. This class is well suited for all life science students (including but not limited to pre-professional students) looking to obtain internships, embark on post-graduate options as well as the knowledge that many successful careers have non-linear and unconventional paths.

Student Learning Outcomes – After successful completion of this course, students will be able to:

1. Career diversity:
2. Identify a variety of career sectors, and educational opportunities, within each sector.
3. Compare and contrast different career paths, including academia, industry and government
4. Career preparation

5. Understand the needs and expectations of local industry, professional school and graduate school
6. Be able to name and define the expectations and skills needed for the different career sectors
7. Be prepared for interviews and improve applications
8. Career opportunities
9. Develop application for an internship or position in your career sector of choice
10. Visualize alternative careers, interdisciplinary careers and develop a plan B for their future ambitions

Course material and assignments

All required course materials will be available through the Canvas e-Learning site. Instructions for and submission of assignments will also be through Canvas.

Prerequisite: N/A

Required Textbooks: N/A

Evaluation of learning:

Qiuzzes (25%)

There will be quizzes (multiple choice) based on individual speakers lecture material. The normal allotted time to complete each quiz is 60 minutes, however to make reasonable accommodations, all students will be given 120 mins to complete each quiz.

Assignments (70%)

There will be regular assignments (Due dates will be finalized on Canvas). Assignments will include preparation of a career plan, preparing a professional quality CV, composing and submitting an application/cover letter, understanding letters of recommendation, exploring alternative career opportunities. ***Addition assignments may also be included*****

Class participation (5%)

Class participation in Canvas discussions is required. Discussions will appear on Canvas.

Grading:

Satisfactory (S)/Unsatisfactory (U)

S > 80%

U < 80%

EXPECTATIONS FOR CLASS DEMEANOR

Students in the classroom are expected to be courteous of other students as well as instructor in the class and conduct themselves in a way that will not interfere with the learning process of other students. Avoid talking or any behavior that can be distracting to other students. Cellular phones should be turned off.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. Once the documentation is ready, please make an appointment during my office hours so that we may discuss your needs.

ACADEMIC HONESTY

Completion of the registration forms at the University of Florida requires every student has signed the following statement:

"I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

Each student in the course is expected to act in accordance with this pledge of academic honesty in class assignments and tests. **Cheating won't be tolerated. If a student is caught cheating, the student will receive a zero for the test and the zero won't be dropped when I determine your grade. The incident will be reported to Deans of Students Office for documentation.**

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.

FOR YOUR INFORMATION

The following information is included at the request of the Office of the Dean for Academic Programs, IFAS. UF counseling Services Resources are available on-campus for students having personal problems or lacking clear career and academic goals, which interfere with their academic performance.

These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling;
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling
3. Sexual Assault Recovery Services (SARA), Student Health Care Center, 392-1161, sexual counseling
4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

Online Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.

Astrobiology MCB5705
Spring 2021 – 3 credits

All course work will be completed online and there are no live lectures only pre-recorded lectures.

Instructor:
Dr. Jamie Foster, Professor, Microbiology and Cell Science

Course Website:
Login available through Canvas https://elearning.ufl.edu/

Contact Information:
I am located off-campus at the UF Space Life Sciences Lab, Kennedy Space Center
My contact information is: **Tel:** 321-525-1047; **Email**: jfoster@ufl.edu;
Zoom: https://ufl.zoom.us/j/7465070513

Office Hours:
Virtual Office Hours: Zoom meeting by appointment

Course Description for Astrobiology:
Astrobiology examines the origin, evolution, and future of life in our solar system. Topics will include: planet and star formation, biosphere formation, evolutionary processes biogeochemistry, microbial adaptation to extreme environments, planetary habitability, and microbiology on the International Space Station.

Learning Objectives for Astrobiology:
By the end of this course students should be able to:
1) Describe and comprehend the fundamental concepts of astrobiology
2) Analyze primary literature articles in the field of astrobiology in order to develop critical thinking skills
3) Develop essential writing and verbal communication skills through essays and oral presentations that target the field of astrobiology

Prerequisites: Since astrobiology is a multidisciplinary field incorporating microbiology, astronomy, chemistry, physics, and geology, students should have taken at least one introductory science class in any of the previously mentioned fields prior to taking Astrobiology.

Suggested Texts:
1. Life in the Universe, Jeffrey Bennett and Seth Shostak, 4th edition
https://www.amazon.com/Life-Universe-Jeffrey-Bennett-ebook-dp-B01C8JRW1A/dp/B01C8JRW1A/ref=mt_other?_encoding=UTF8&me=&qid=1609176402

2. Reading Primary Literature: a practical guide to evaluating research articles in Biology
Available on Amazon and on Pearson for about $16.

https://www.pearson.com/store/p/reading-primary-literature-a-practical-guide-to-evaluating-research-articles-in-biology/P100001373371

Grades and Grade Points (1000 total):

1. Online Discussions and Group Essay Collaborations (*25% of your final grade;* 250 points) – Each week you will be asked to participate in a group activity where you will work with others in the class to discuss in depth an astrobiology-related concept that was covered in one of the lectures. You will be evaluated on your level of engagement and participation in the topic as well as the depth of understanding you convey on the topic material. Additionally, you will be evaluated on how well you incorporate the information you learned from that feedback and group discussion. All feedback will be provided to you via Canvas.

2. Weekly quizzes *(18% of your final grade; 180 points)* – For each module there will be a quiz that needs to be completed online. The quizzes will include all material covered that week including podcasts and designed to reinforce key concepts of the weeks learning materials. The quizzes will be untimed and open book

3. Astrobiology Communication and Art Project *(10% of your final grade; 100 points)* This assignment builds off the idea that there is a fundamental link between art and science: creativity and communicating ideas. Additionally, I think there is a growing public distrust of science and I think as science ambassadors we all have to continually work on improving our abilities to communicate the scientific world to the average layman. Therefore, the overall objective of this assignment is for you to work on your communication skills and also foster your creativity to think of new ways to communicate complex science to the public. **Your assignment** will be to pick a topic in Astrobiology and generate some form of presentation of that material, in which someone with a non-science background could learn and understand. This can be any format: rap video, podcast, interview with researcher, dance, painting, animation, comic book (I have seen them all).

4. Scientific Inquiry Activity *(2.5% of grade; 25 points*) This assignment works on your ability to ask scientific questions about various research topics. You will be asked to listen to a mock scientific seminar and ask potential questions regarding the content of the seminar.

5. Scientific Writing Activity *(2% of grade; 20 points)* This assignment works will provide you some of the rules of the road with writing in science. The activity will include tips and suggestions on how to improve your scientific writing quality.

6. Written Exams (45*% of your final grade; 450 points*) - Questions on the exams will take the form of short answers and essays and build off of your collaborative discussions and essays. These exams will allow you to demonstrate your familiarity with the concepts, terminology, and methodologies covered in the course. Each exam will be worth 150 points and given online using Honorlock.

For more information on current UF policies for assigning grade points see:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Attendance and Make-Up Work: For planned excused absences, such as interviews, you must contact the instructor 48 h in advance of the missed exam and provide adequate documentation.

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Grading: Straight Scale
For more details of the University of Florida grading policy please visit:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

930 – 1000	points	93% - 100%	A
900 – 929	points	90% - 92.9%	A-
870 – 899	points	87% - 89.9%	B+
830 – 869	points	83% - 86.9%	B
800 – 829	points	80% - 82.9%	B-
770 – 799	points	77% - 79.9%	C+
730 – 769	points	73% - 76.9%	C
700 – 729	points	70% - 72.9%	C-
670 – 699	points	67% - 69.9%	D+
630 – 669	points	63% - 66.9%	D
600 – 629	points	60% - 62.9%	D-
Less than 600	points	<60%	E

Online Course Evaluation Process For All Students
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0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

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  Counseling Services
  Groups and Workshops
  Outreach and Consultation
  Self-Help Library
  Wellness Coaching

- **U Matter We Care, www.umatter.ufl.edu/**

- ***Career Connections Center,* First Floor JWRU, 392-1601, https://career.ufl.edu/.**

Student Complaints:

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

Online Course: http://www.distance.ufl.edu/student-complaint-process

University of Florida
Department of Microbiology and Cell Science

Comparative Microbial Genomics

MCB 6318 Section 162B (2 credits)
MCB 6318 Section 069F (2 credits)
Advanced Bioinformatics
MCB4934 Special Topics, Section VDC1 (3 credits)

Spring SEMESTER 2021

COURSE DESCRIPTION: Methods to allow experimental scientists lacking computer programming skills to efficiently use the genomic and post-genomic data that is freely available over the web to predict protein function. Examples will be mainly taken from the field of microbial metabolism and regulation.

PREREQUISITE COURSES: Grade B^+ or higher in BSC6459 OR grade A^-/A in BSC4434c

COURSE INSTRUCTORS & OFFICE HOURS:	Dr. Valerie de Crécy-Lagard Every **Wed 8h30 to 9h30 AM** through the Canvas ZOOM tool

E-mail for appointments: I prefer that you use the email through CANVAS. For emergencies you can email us to vcrecy@ufl.edu

WEB PAGE: https://ufl.instructure.com/courses/417339

COURSE OBJECTIVES:

- The students will be able to perform database search in order to identify genes that are physically linked or that follow specific phylogenetic distribution patterns.
- The students will be able to extract information related to genome wide experimental data (gene or protein expression, phenotype, interaction data) gene or protein expression from databases and use this as building blocks or input for research projects
- The students will be able to use databases to search and identify structural homolog or catalytic domains in proteins to elaborate upon the function of unknown proteins
- The students will be able to use databases that integrate different types of data and use advanced visualization tools.
- The students will apply these methods to current issues in microbial physiology and metabolism.

STUDENT RESPONSIBILITIES: Students are expected to meet the deadlines for their assignments, project updates, peer reviews and final project. No extension for the module assignments will be given without prior approval by the instructor and only for catastrophic events (such as hurricanes). Because of the peer review process and the tight deadline for course grade submission, all deadlines for the Final project (four updates, 3 peer reviews and final submission) will be strictly enforced with NO possibilities of extension.

STUDENT EVALUATION:
Students will be evaluated on the basis of:

Assignments:	35%
Project updates:	15%
Peer Reviews:	15%
Final Project:	35%

Final grades will be based on the following performance standard:

100 - 92 %	=	**A**
< 92 - **88** %	=	A-
< 88 – 85 %	**=**	**B+**
< 85 - 82 %	=	B
< 82 - 78 %	=	**B-**
< 78 - 75 %	=	**C+**
< 75 - 70 %	=	**C**
< 70 - 68 %	=	**C-**
< 68 - 65 %	=	**D+**
< 65 - 60 %	=	**D**
< 60 - 58 %	=	**D-**
Less than 58 %	=	**E**

ASSIGNMENTS: For each module, the student will complete between 4 and 9 assignments. Each assignment is designed to apply the concepts, methods or websites covered during the lectures.

FINAL PROJECT: At the end of the course, the student is required to submit a final project in which the goal is to make a hypothesis of the function of a hypothetical protein/family of proteins by applying the knowledge gained during the course. The student will be given a gene family and using a combination of data-mining, comparative genomic analysis, phylogenomics and protein sequence and structure analysis tools the student will have to present what can be inferred about the protein family and a prediction of function or a link to a pathway or a specific metabolic area.

The final project has 3 components that will be graded individually.

1. **Weekly updates (15% of the grade).** To help the student organize the information gathered, three updates are required.

Update 1 : Summarize the results of a literature search you did on your family. Summarize the blast and family searches you did on this family Show a multiple alignment, a phylogenetic tree of the family and potential active sites visualized using Logos. What associations can you find using the String database. Any physical clustering with genes of known function? Any gene fusions?

Update 2: Can you find any associations with other genes using Microarray or RNA seq databases? Did you find binding sites for known transcription factors? Did you find any associations using other types of experimental data (fitness, phenotypes, physical interactions)?

Update 3: What structural information is there about members of your family? Were you able to build a structural model? Did you find or can you predict any ligand bound in the structure? Is this ligand biologically relevant or not? Can you predict interactions with nucleic acids or other proteins?

Update 4: Explore advanced tools that you can use on you family and present at least two. These can be: compare logos, Itol tree or mapping transcriptomic data (or metabolomic) to pathway maps.

IMPORTANT: The updates have to be submitted on time or you will not be able to participate in the peer-reviews assignments. I will be very strict on enforcing the deadlines with 50% off of the Update grade when submitted 12 hours late, and a zero on the assignment after 24H (plus a zero on the peer-review grade).

2. Peer review (15% of the grade)

The student will be assigned to two peer-reviews for each update (a total of 6). The student will need to complete the rubric provided as well as the feedback section. The grading performed by the student is only part of the author's feedback and will not affect the grade of the author. The feedback and analysis of the updates will be graded by the instructors (15% of the grade).

3. Written component individual assignment - Final Paper (35% of the grade)

The student will need to propose a functional hypothesis for your "unknown" and defend it in the paper using bioinformatic evidence. We **do not** expect a concatenation of the updates. An example of the type of work expected is the DUF71 paper that student will read in Module 4. The evaluation will be based on the clarity and the logic of your argumentation as well as the quality of the bioinformatic data presented. Finally, the adherence to correct scientific writing style will be evaluated.

STEPS:

1. Initial submission for per review
2. Peer review
3. Submission of final paper

COURSE SCHEDULE and DEADLINES are listed on CANVAS

Module 1 Dealing with the avalanche of data
Week 1: Extracting genomes and proteins from databases

Module 2 Linking gene and function
Week 2: From gene to pathway and from pathway to gene
Week 3: Using comparative genomic methods to identify missing genes

Module 3 Genome-wide analysis of experimental data & data Integration
Week 4: Techniques to study global gene expression. Mining gene expression databases and regulatory sites identifications
Week 5: Analyzing fitness and phenotype data, data integration, mapping data to pathway

Module 4 Mining and predicting 3D structures
Week 6: 3D structure visualization and mining and predicting of protein-protein, protein-ligand and protein nucleic acid interactions

Module 5 Data Visualization
Week 7: Visualization tools (Mapping data to phylogenetic trees, comparing logos, etc)

Final project submission, week 8
Final Project

March 8	Final paper submission (**for MCB 6318 only**)
Every Wednesday between March 10 and April 14	
	Period 2 final paper Q & A (**for MCB4934 only**)
April 19	Final paper DRAFT submission (**MCB4934-VDC1 only**)
April 21	Period 2 paper draft review (**MCB4934-VDC1 only**)
April 26	Final paper last submission (**MCB4934-VDC1 only**)

REFERENCE TEXTBOOKS:

These books are not required but cover many of the topics we will discuss in class:

Bioinformatics. A practical guide to the analysis of genes and proteins (Third Edition). Editors A.D. Baxevanis and B.F.F. Ouellette. 2004. John Wiley & Sons, Inc., Hoboken, New Jersey. ISBN 0-471-47878-4 (a fourth edition is in the works, but not released yet).

Bioinformatics: Genes, Proteins and Computers (First edition). Editors C.A. Orengo, D. Jones , J. Thornton. 2003. Bios Scientific Publisher, Oxford, UK. ISBN-10: 1859960545.

University of Florida Policies

Grades and Grade Points
For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Attendance and Make-Up Work
Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Services for Students with Disabilities
The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,* www.counseling.ufl.edu
  Counseling Services
  Groups and Workshops
  Outreach and Consultation
  Self-Help Library
  Wellness Coaching

- U Matter We Care, www.umatter.ufl.edu/

- *Career Connections Center,* First Floor JWRU, 392-1601, https://career.ufl.edu/.

Academic Resources

- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://elearning.ufl.edu/student-help-faqs/
- Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://www.crc.ufl.edu/
- Library Support, http://cms.uflib.ufl.edu/ask. 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. http://teachingcenter.ufl.edu/
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. http://writing.ufl.edu/writing-studio/

Course Evaluation

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*" You are

expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Additional comments regarding academic integrity:
Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

- Have another person complete a quiz in this course
- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

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.

Microsoft Office 365 Software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

Most problems, questions and concerns about the course will be resolved by professionally communicating with the instructor or the TAs.

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

- Online Course: http://www.distance.ufl.edu/student-complaint-process.

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions maybe delayed.
If a student is lacking professionalism repeatedly, the instructor has the rights to file formal complaint against the student through the Dean of Student office.

University of Florida
Department of Microbiology and Cell Science

Microbial Defense/Host-Microbe Interactions
MCB 6355 (1 credit)

SPRING SEMESTER 2021
Tuesday, March 16 - Thursday, April 08, 2021

COURSE DESCRIPTION:

MCB6355. Microbial Defense/Host-Microbe Interactions Credits: 1. Principles of bacterial virulence, host defense to microbial invasion and host-microbe interactions will be examined in a context of molecular and cellular biology involving both plants and animals.

COURSE INSTRUCTORS	Dr. Joseph Larkin III Rm.1253 Phone: 392-6884 E-mail: jlarkin3@ufl.edu	Dr. Nian Wang Classroom Phone: 863-956-8828 E-mail: nianwang@ufl.edu

Foreach Zoom appointment, we recommend 15-20 min.

WEB PAGE: The Course can be found in Canvas

LECTURES: Dates: Tuesday, March 16 - Thursday, April 08, 2021. The lectures will be recorded and be available at Canvas. At each Tuesday or Thursday from March 16 to April 6, there will be an open discussion period (one hour) to facilitate the learning. The open discussion section will be recorded for students who cannot attend in person. The time of the open discussion will be determined based on largest student availability survey.

COURSE OBJECTIVES:

- **This class makes the assumption that students possess a limited understanding of immunology. As such, a foundational immunological background will be developed**
- To develop the concepts and understand the principles of bacterial virulence, host defense to microbial invasion and host-bacteria interactions.
- To develop the concepts and skills required to understand and critically evaluate research that addresses molecular and cellular biology events involved in host defense to microbial pathogens and virulence mechanism of bacterial pathogens.

STUDENT RESPONSIBILITIES:

Students are required to attend the class in person for on campus students or take class online. Students need to complete the assignments on canvas. Students will be responsible for reading literature referenced in class and for viewing HS lectures.
Students need to take the final exam. Final exam will consist of materials in lectures, outside readings, and HS lectures.

Grade:

Grades will be assigned based on completion of 2 assignments each worth 50 pts of the grade for a total of 100 pts (50% of grade), and a final exam worth 100 pts (50% of grade).

Final grades will be based on the following performance standard:

90 - 100 %	=	**A**
85 - 90 %	=	**B+**
80 - 84.9 %	=	**B**
75 - 79.9 %	=	**C+**
70 - 74.9 %	=	**C**
60 - 69.9 %	=	**D**
Less than 60 %	=	**E**

Assignments:

Two assignments will be assigned for this course: One each by Drs. Larkin (Assignment 1) and Wang (Assignment 2). Assignments will be located within Canvas under the tab "Assignments." The Due dates are below:

March 23th @ 6pm EST (Dr. Larkin)
April 6st @ 6pm EST (Dr. Wang)

Course Final Exam: April 8, 2021 (6 am-10 pm)

The final exam will be administered through Canvas with proctored through ProctorU.
Exam questions will be short assays including the lectures and main topics covered in this course. The duration of the final exam will be 2 hours. Please review the ProctorU FAQ pdf in the discussion section if there are any questions on the use of ProctorU.

TEACHER EVALUATION:

Please conduct on-line teacher evaluation and provide feedbacks and suggestions for the course on April 6. 10-15 minutes are sufficient for the evaluation. The website for the online teacher evaluation is: **evaluations.ufl.edu**

COURSE SCHEDULE:

Table 1 Schedule of topics

Date	Topic
March 16 (Wang and Larkin) Larkin	Class introduction **Mammalian Host Microbe Interaction: pathogen recognition receptors** et al (2018) Modulation of the host microbiota to improve innate resistance. *Current Opinion in Immunology*. 54:137-144. Chen and Stappenbeck (2019) Microbiome control of innate reactivity. *Current opinion in Immunology*. 6.107-113 Knauf et al (2019) Immunity, Microbiota, and Kidney disease. *Nature Reviews in Immunology*. preprint
March 18 (Larkin)	**Mammalian Host Microbe Interaction: Th 17 cells** Related papers: Kiyono H and Kunisawa J (2011) Peaceful mutualism in the gut: Revealing key commensal bacteria for the creation and maintenance of immunological homeostasis. *Cell Host and Microbe*. 83-84. M. Kleinewietfeld et al., (2013) Sodium Chloride drives autoimmune disease by the induction of pathogenic TH17 cells. Nature, doi:10.1038/nature11868. Curtis M and Way SS. (2009) Interleukin 17 in host defence against bacterial, mycobacterial, and fungal pathogens. Immunology 126:177-185.
March 23 (Larkin)	**Mammalian Host Microbe Interaction: Tolerance** Related papers: Atarashi K et al. (2011) Induction of Colonic regulatory T cells by Indigenous Clostridium Species. *Science*. 331. Doi: 10.1126/science. 1198469. Sakaguchi et al. (2010) Foxp3+ regulatory T cells in the human immune system. Nature reviews Immunology. 10: 490-500.
March 25 (Wang)	Lecture: bacterial pathogens and virulence mechanism
March 30 (Wang)	Lecture: Bacterial virulence mechanism
April 1 (Wang)	Lecture: Bacterial virulence mechanism (continues)
April 6 (Wang)	Lecture: Plant immunity

April 8	Final exam

REFERENCE TEXTBOOKS:

Abbas A.K. and Lichtman A.H. 2007. *Cellular and Molecular Immunology*. Sixth Edition. Saunders, Philadelphia, PA. ISBN- 978-1-4160-3122-2.

Virulence Mechanisms of Bacterial Pathogens 4th Edition by Kim A. Brogden, F. Chris Minion, Nancy Cornick, Thaddeus B. Stanton ASM Press; 4 edition (August 15, 2007) ISBN-13: 978-1555814694

Virulence Mechanisms of Plant-Pathogenic Bacteria Edited by Nian Wang, Jeffrey B. Jones, George W. Sundin, Frank White, Saskia Hogenhout, Caroline Roper, Leonardo De La Fuente, and Jong Hyun Ham APS Press; 1st edition (2015) ISBN 978-0-89054-444-0.

Academic Honesty, Software Use, UF Counseling Services, Services for Students with Disabilities

Privacy Statement

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices 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 communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

The university's honesty policy regarding cheating, plagiarism, etc.

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. Click here to read the Honor Code. 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.

Campus Resources:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,

Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center websiteAcademic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

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

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.

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.

Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

0001 Reid Hall, 392-8565, **www.dso.ufl.edu/drc/**

Molecular Genetics
MCB6937 Syllabus summer-C 2021

Course Prerequisites: BSC 2010 and BSC 2010L, or equivalent, with minimum grades of C.

Instructors: Dr. William Gurley (Department of Microbiology & Cell Science)

Textbook: Lewin's Genes XII, (strongly recommended, but not required), Authors: Krebs, Goldstein and Kilpatrick

Introduction: This course will discuss the synthesis and manipulation of DNA and the principles of gene expression at the molecular level in both prokaryotes and eukaryotes. The topics covered will include an introduction to the concepts of DNA replication, repair and packaging of the genome into chromosomes. In preparation for this course, you should have an understanding of basic college level introductory biology and it is recommended to have at least one other more specialized biology course such as Microbiology, Botany, Zoology, Genetics or Biochemistry.

Student Learning Goals:
The goal of MCB6937(Molecular Genetics) is for participants to understand the roles of DNA and RNA in both prokaryotes (eubacteria and Archaea) and eukaryotes, including yeast, plants, drosophila and man. *Students will:*

1. Develop an appreciation of the organization and evolution of living systems and the role of genetic mutation and selection in the evolution of the human species.
2. Acquire knowledge regarding DNA replication in bacteria, plasmids, transposable elements, as well as eukaryotic organelles and the nucleus.
3. Become familiar with the molecular events involved in DNA repair and recombination.
4. Acquire a *detailed* understanding of the molecular mechanisms related to gene expression at the transcriptional level, with an emphasis on eukaryotes.
5. Learn to extract information from genomic databases and perform DNA sequence analyses using online bioinformatics tools.

Presentation Format: This course will be a hybrid between an online course and a traditional lecture style course. The goal is to have **all lecture material recorded live each lecture** and posted here at the Canvas website or at Vimeo.com. There will be approximately 3 hours of recorded lecture material available each week. Each week there are two video lectures recorded, a 50 min and a 100 min lecture. It is recommended that you take a break in the middle of the 100 min lectures in order to keep your attention active.

COVID-19 Modifications: Live lectures were recorded in the spring 2020 semester up until one week after spring break. At that time, lectures from spring 2019 were used. These 2019 are still up to date. Additional videos, such as the Focus Topics and the "molecule videos", were recorded in the spring semester and added to the study material to enhance the instruction.

Office hours: Fridays 3-5+ pm
Email the instructor for an appointment time. We can meet using Zoom.

Honor Code violations: Exams 1, 2, 3, 4, and the Optional Final are closed book and no outside material may be used during the exam including web-based and printed materials. Communication with persons not involved in proctoring is also prohibited during the exam. Failure to comply will result in a failing grade for the course.

Computer requirements

All exams will be administered through **HonorLock** using Canvas in E-learning with students using personal computers with an external camera (120˚ wide angle) for side-view monitoring. The exam may be taken at any location that is not flagged by **HonorLock** during course of the semester. All students (campus and distance) will be given at least a 48 hr window to take the exams. The major exams should be taken by the posted deadlines.

All exams will be proctored with using **HonorLock.** The use of multiple devices to take exams and attempts to Screen Print during exams is strictly forbidden and will be prosecuted as Honor Code violations. Anyone not able to meet the above laptop computer requirements should contact the instructor as soon as possible.

Grade Components:

Exam 1-2 Jun 5-9 (38.6% of final grade)

Exam 3 July 10-14 (26.7% of final grade)

Exam 4 July 31-Aug 3 (26.7% of final grade)

Optional re-take Final: August 4-6 (a chance to re-take your lowest exam. Only your highest score will be used.)

(Total from Exams + 92.0%)

2-Homework Quizzes (3.5% of grade)

3-Gene Structure/Bioinformatics Parts 1, 2, & 3 (5.0% of grade)

Due dates:

Part-1 & (Part 1B optional) **May 26**

Part-2 June 16

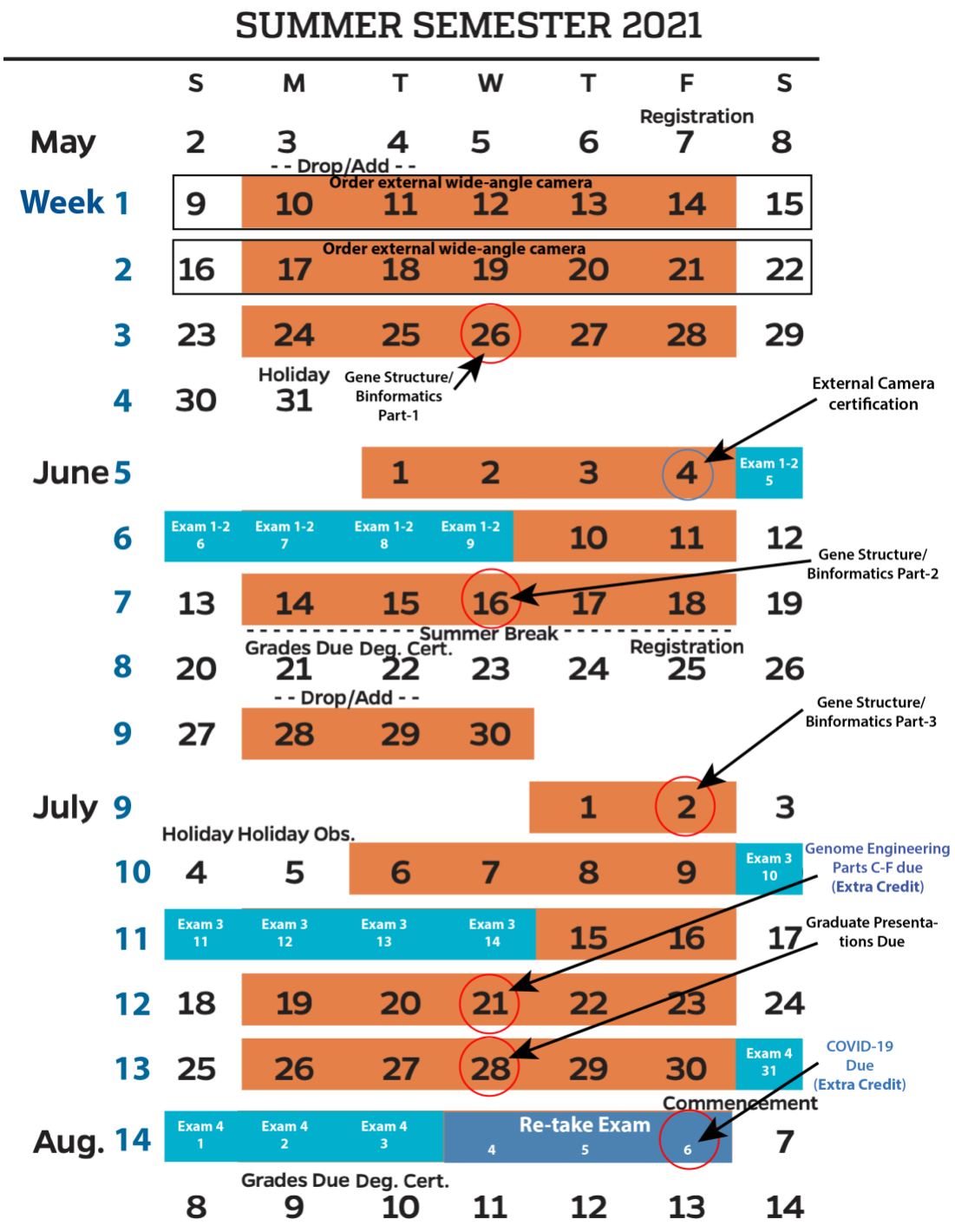
Part-3 July 2

4-Genome Engineering 2021 parts C-F: July 21 (2.0%; optional extra credit)

5-Graduate Presentation: July 28 (2%)

5-COVID-19 extra credit: August 6 (1% optional extra credit; addition to the original syllabus)

6-TA weekly quizzes: (1% optional extra credit)



Grading Policies:

4 Major Exams: 92 points.

There will be four major exams plus an optional re-take exam. The questions will be drawn from 15-18 questions banks per exam (40 multiple choice and fill-in-the-blank), so no two exams or re-takes are the same. *Note*: the exams are not of equal weight. Exam 1 is worth much less than Exam 4. The exam weights are proportional to the number of lecture hours of material covered.

Homework assessments: 4.5 points.
A perfect score will equal 4.5 points on all homework assessments. Homework assessments are open book exercises to encourage you to read the lecture material before or during the week the topic is covered in lecture. The best way to use the Homework quizzes is to take them multiple times to uncover all the questions. Use them to study using no notes to identify gaps in your knowledge.

Gene Structure/Bioinformatics Project: 5 points. This will begin after Exam 1. You will be assigned an unknown cDNA and expected to identify the gene and organism. In addition, you will learn how to conduct a multiple sequence alignment using web-based tools.

The optional Genome Engineering 2020 exercise will have multiple parts with a total of 1 point towards the final course grade as extra credit.

There will be no grade curve. (36% of the class has earned an "A" for the last 3 years.)

Grading Scale Numerical Equivalents	
A = 90.5 or above	**C** = 67.5-73.49
A- = 88.5-90.49	**C-** = 64.5-67.49
B+ = 84.5-88.49	**D+** = 61.5-64.49
B = 80.5-84.49	**D** = 57.5-61.49
B- = 78.5-80.49	**D-** = 53.5-57.49
C+ = 73.5-78.49	**E** = 0-53.49

UF Grading Policies:

http://www.registrar.ufl.edu/catalog1011/policies/regulationgrades.html

Assigning a grade of Incomplete:

I am <u>not</u> allowed to assign an Incomplete, even if you have unfinished assignments or exams at the close of the semester. There are very few exceptions to this rule in the case of extreme extenuating circumstances. For our department, the historical rates are less than 0.2% of all students have been assigned an Incomplete grade. I can be flexible on a case-by-case basis with regard to deadlines, but ONLY during the time the course is offered. **Any unfinished assignments or exams existing after the last day of classes will be assigned an automatic grade of Zero.**

Schedule of lecture topics:

(*Note*: This schedule is only approximate and will vary according to the amount of material covered in class between Exams.)

Quick Guide to lecture topics:

Module 1:

- Evolution of early man: culture as phenotype?
- Replication of the genome (bacteria & eukaryotes)
- Extrachromosomal replicons (plasmids, mitochondria)
- Agrobacterium tumor-inducing plasmid
- Bacterial cell cycle and ColE1 replication mechanism

Module2:

- DNA replication details of mechanism and proteins involved
- Recombination in bacteria and eukaryotes
- DNA-based Transposons in bacteria
- Eukaryotic Transposons (DNA-based)
- Retrotransposons and Retroviruses (eukaryotes)

Module 3:

- DNA repair systems (bacterial and eukaryotic)
- Bacterial Transcription
  - promoters, RNA polymerase structure, sigma structure, termination, rho
- The Operon (basic concepts, CAP regulation, Lac, Ara and Trp)

Module 4:

- Chromosomes
- Histones and nucleosomes
- Eukaryotic Transcription
  - Gene structure and promoters
  - Basal factors: TFIID, TFIIH, TFIIB, Mediator, preinitiation complex
- Eukaryotic transcriptional regulation
  - DNA binding domains, steroid receptors, activators & repressors
  - Plant transcription
- Epigenetics
  - RNA-based silencing, X-chromosome inactivation, transcriptional memory, silencing of ancient transposons

Readings from Lewin's Genes XII*:

Exam Module 1

Genes XII Chapter 10: The Replicon Initiation of Replication

Genes XII Chapter 12: Extrachromosomal Replicons

Exam Module 2

Genes XII Chapter 11: DNA Replication

Genes XII Chapter 13: Homologous and Site-Specific Recombination (13.1-13.10)

Genes XII Chapter 13: Homologous and Site-Specific Recombination (13.1-13.10)

Genes XII Chapter 15: Transposable Elements and Retroviruses (Part 1) (sections 15.1-15.6)
Genes XII Chapter 15: Transposable Elements and Retroviruses (Part 2) (15.7-15.18)

Exam Module 3
Genes XII Chapter 14: Repair Systems (sections 14.1-14.11; 14.13-Summary)
Genes XII Chapter 17: Prokaryotic Transcription (sections 17.1-17.14; 17.17-17.19)
Genes XII Chapter 17: Prokaryotic Transcription (termination of transcription: sections 17.15-17.16)
Genes XII Chapter 24: The Operon (sections 24.1-24.10)
Genes XII Chapter 24: The Operon CAP (section 24.11)
Genes XII Chapter 24: The Operon (*trp* Operon) (section 24.12-24.14)

Exam Module 4
Genes XII Chapter 7: Chromosomes (7.1-7.7; 7.9-7.19)
Genes XII Chapter 8: Chromatin (8.1-8.5; 8.7-8.8; 8.10; 8.12-Summary)
Genes XII Chapter 18: Eukaryotic Transcription (Part 1) (18.1-Summary)
Genes XII Chapter 26: Eukaryotic Transcription Regulation (Part 2) (26.1-26.6)
Genes XII Chapter 27: Epigenetics (27.1-27.13)

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*The topic selection for lecture is subject to change at the instructor discretion. Students will be given advance notice of changes to accommodate their study and exam preparation.

Class Attendance

Not applicable for an online course. This is true for all sections regardless of whether it is a “Campus” or an “Online” section. Usually, there are a lot of unfilled seats after the first week of lecture. If you meet the COVID-19 campus guidelines, you are welcome to attend in person, even if you are enrolled as “online”.
Note: in-person lectures are only an option for spring semesters.

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Counseling and Wellness Center

Resources are available on campus for students having personal problems or lacking clear career and academic goals, which interfere with their academic performance. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, http://www.counseling.ufl.edu/cwc/Default.aspx - personal and career counseling;
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling;
3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual assault counseling;
4. Career Resource Center, Reitz Union, 392-1601, www.crc.ufl.edu career development assistance and counseling.

For **emergencies** call the University of Florida Police Department: 392-1111 or 9-1-1 for emergencies.

Communication Methods for Online Students

Recommended for the syllabus of a course that delivers 80% or more of its content online is a statement that clearly outlines preferred methods for private and public communication regarding the course and for resolving technical issues the student may face.

Student Complaint Process: The following is recommended for inclusion in the syllabus to inform students on the process of filing a complaint about the course:

- *Residential Course:* https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.
- *Online Course:* *http://www.distance.ufl.edu/student-complaint-process.*

Please review this policy to ensure that your syllabus is in compliance, and just as a reminder, your syllabus must be posted on publicly accessible UF web sites per the August 26, 2013 Memorandum available at https://administrativememo.ufl.edu/2013/08/posting-course-syllabi/.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Class Demeanor

Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

NETIQUETTE GUIDE FOR ONLINE COURSES

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Proctoring Standards

A USB external camera with a 120˚ wide-angle field of view must be used for all proctored exams which consist of Exam 1-2, Exam 3, Exam 4, and the optional Final Exam (a retake of the lowest scoring exam). The external camera should be positioned for a side-view of the test taker so that the proctor can view the test taker's head, hands (both), keyboard, and screen. Access to all proctored exams requires that the test taker pass the External

Camera Certification Exam. Failure to meet proctoring standards may result in a grade assignment of zero for the exam in question. Note that the proctor does not need to prove cheating occurred, only that the proctoring standards were not met. All disputes will be resolved through the Office of the Dean of Students.

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 (https://www.dso.ufl.edu/sccr/process/student-conduct-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.

Materials and Supplies Fees

Access to an external 120˚ wide-angle USB camera is required. There are no additional fees for this course.

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.

Microsoft Software for UF students

http://www.software.ufl.edu/

The Office of Information Technology has great news for University of Florida students! If you want to upgrade your operating system or need Microsoft Office Suite, this media will be available in the Spring 2011 semester. The different media available are: Windows 7 operating system Upgrade, Microsoft Office Professional Plus 2010 (32-bit/64-bit) for PC or Microsoft Office for Mac 2011.

Software is free for UF students.

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357). Once the media is available, you can get it at the UF Computing Help Desk or at the UF Bookstore.

Diversity, Inclusion and Equity

This class fully supports the University of Florida’s commitment to diversity, inclusion, and equity. By fostering a sense of belonging for students, staff and faculty while leveraging the uniqueness of the people who study and work at the university, we believe our campus community is enriched and enhanced by diversity, including but not limited to race, ethnicity, national origin, gender, gender

identity, sexuality, class and religion. Our course will help foster an understanding of the diversity of our campus community, locally and globally.

We will strive to create a learning environment for our students that support a diversity of thoughts, perspectives and experiences while honoring your identities. To accomplish this, please let us know:

- If you have a name and/or set of pronouns that differ from those that appear in your official university records
- If you believe your performance in the class is being impacted by your experiences outside of class. Do not hesitate to reach out and talk with us. We want to be a resource for you. Anonymous feedback may be submitted, which may lead us to make a general announcement to the class, if necessary, to address your concerns.
- We, like many people, are still in the process of earning about diverse perspectives and identities. If something was said in class (by anyone) that makes you feel uncomfortable, please talk to us about it.

  Contact us with any concerns regarding inclusion and equity, including accessibility of learning materials, equipment, and software.

Campus Resources Summary:

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: http://www.counseling.ufl.edu/cwc/Default.aspx, 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, 392-1111 (or 9-1-1 for emergencies). http://www.police.ufl.edu/

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://www.crc.ufl.edu/

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

MCB6937: Methods to study prokaryotic transcriptional regulation (1 credit)

Spring 2022
MCB6937 will cover theoretical aspects as well as the methods available to identify and study prokaryotic proteins involved in transcriptional regulation. This course will explore specific methods used for the *in silico* and for the biochemical study of transcription factors.

Introduction
The expression of genes encoded in the genome of all living organisms are switched on and off in response to external and internal stimuli. The dynamic interplay among the proteins that sense these changes and the modulation of gene expression is one of the most fascinating aspects studied by molecular biology. The knowledge gained from the study of the mechanisms involved in the modulation of the activity of these proteins helps in the understanding of the critical contribution of microorganisms to the host's health and disease status, their responses to environmental changes as well as their ability to use an unimaginable variety of chemicals as nutrients.

Student Learning Outcomes – After successful completion of this course, students will be able to:

- Understand the role of transcription factors in the regulation of gene expression.
- Compare and contrast one-, two- and three component transcription regulatory systems.
- Use *in silico* methods to identify, classify transcription factors and predict DNA and/or RNA binding sites in transcription factors.
- Select biochemical methods best suited to study different kind of transcription factors.
- Compare and contrast methods available for the biochemical study of chemicals and macromolecules as regulators of transcription factor's activity.
- Learn to set experimental designs directed to link molecular mechanisms to in vivo responses/consequences.

Lectures: Online through Canvas
Instructor: Dr. Graciela L Lorca
Office: Genetics Institute, Room 307
WebPage: Canvas (https://ufl.instructure.com/). Please select MCB6937.
On line help with classroom technology: http://helpdesk.ufl.edu/
Pre-requisite: MCB3020 or MCB3023
Communication: for questions regarding class and textbook content use the Discussion Board, for issues on Home Work Assignments, class organization check first the syllabus, the announcements and calendar on Canvas, then post your questions on the discussion board. For all other issues contact Dr. Graciela Lorca.

VIRTUAL OFFICE HOURS: will be available every week (Tuesdays at 3PM) through the Zoom Conferences in Canvas. To participate go to

Zoom Conferences in the left of your screen and join! You will receive a weekly remainder by email.
If you cannot make it to office hours you can request an appointment. Send an e-mail with three suggested times and I will choose one for us to meet.

Contact Information: Use TEACHER in your emails through Canvas ONLY (personal emails should only be used in a case of emergency)

Dr. Graciela L Lorca:

Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use glorca@ufl.edu)
Phone: 273 8090 (please leave a message).

- **Discussion Board:** A discussion board is available in Canvas. It is very useful, please post and answer your questions on class content and organization there. Postings and answers are monitored by the instructor to make sure no mistakes get propagated. There are several discussion themes. Please post your questions in the adequate section.

Material
- **Textbook:** textbook is not required; this course is based on peer reviewed papers either available for free through the links provided or through the UF library (ejournals).
- **Suggested readings**: For each module, suggested readings will be posted as pdf documents on Canvas or as links to download them from PUBMED (see working list at the end of the document). Remember to connect to UF through VPN (if outside campus) before accessing the journals (https://connect.ufl.edu/it/wiki/pages/glvpn.aspx).

Assessment of learning

Assignments (700 points): Activities will be assigned by module. The activities include online research, use of online tools, virtual laboratory exercises and graded quizzes. The goal of these assignments is that the student keep-up with reading of the material on weekly basis. **The activities are mandatory and count towards the final grade. They should be completed by the deadline indicated on Canvas.**

Critical integrative review (300 points): The final paper will involve the search and writing of a critical review of at least 5 scientific articles on a Bacterial transcription factor/family (original research, no reviews will be allowed). The student will have to complete the review which contains the following five mandatory aspects: (1) *In vitro* experimental approaches to study TF, (2) *In vivo* experimental approaches to study TF, (3) Biochemical methods to study TF interactions with small molecules, (4) Biochemical methods to study TF interactions with proteins, and (5) Practical applications.

LATE SUBMISSION POLICY: a 5% deduction will be applied per day that the assignment/s is/are late.

Make-Up policy: Make-up assignments will ONLY be allowed with a VALID justification. If one assignment is missed, it will result in a score of 0 (see below for "Excused absences").

Excused absences:
Documentation MUST be provided for absences caused by serious illness, accident, jury duty, or death in the immediate family. You must contact the instructor **as soon as possible** of the missed assignment and I will arrange an alternative time for the submission.

Requirements for class attendance and make-up assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Grades and Grade Points
For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Grading: Straight scale

Grading Scale	
A	900 or above
A-	860-899
B+	830-859
B	790-829
B-	750-789
C+	720-749
C	690-719
C-	660-689
D+	630-659
D	600-629
D-	570-599
E	560 or below

Schedule of Classes

Week	Unit	Module. Topic
W1	Unit 1	**Transcription factors (TF): definitions, history and classification** 1. Review on the prokaryotic transcriptional machinery and its components Review on prokaryotic mechanisms of regulation of gene expression 2. Classification of TF into families: One-, two and three component systems **3.** Genomic occurrence of TF encoding genes and their roles in environmental adaptations
W2	Unit 2	***In silico, in vitro* and *in vivo* approaches to study TF** 4. Genomic identification of TF and their binding sites: use of online tools 5. *In vivo* Experimental approaches to study TF 6. *In vitro* Experimental approaches to study TF
W3		7. Biochemical methods to study TF interactions with small molecules 8. Biochemical methods to study TF interactions with proteins
W4	Unit 3	**Practical applications: Manipulation of transcriptional regulation** 9. Applications in synthetic biology and as targets of new antimicrobials

University of Florida Policies

Grades and Grade Points

For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Attendance and Make-Up Work

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Services for Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center (https://disability.ufl.edu/get-started/). 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.

Campus Helping Resources

Health and Wellness

- U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website (https://umatter.ufl.edu/) to refer or report a concern and a team member will reach out to the student in distress.

- Counseling and Wellness Center: Visit the Counseling and Wellness Center website (https://counseling.ufl.edu/) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website (https://shcc.ufl.edu/).

- University Police Department: Visit UF Police Department website (https://police.ufl.edu/) or call 352-392-1111 (or 9-1-1 for emergencies). UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website (https://ufhealth.org/emergency-room-trauma-center).

- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website (https://gatorwell.ufsa.ufl.edu/) or call 352-273-4450.

Academic Resources

- E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services (https://career.ufl.edu/).
- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources (https://uflib.ufl.edu/).
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring (https://teachingcenter.ufl.edu/).
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers (https://writing.ufl.edu/writing-studio/).
- Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information (https://sccr.dso.ufl.edu/policies/student-honor-%20code-student-conduct-code/).
- On-Line Students Complaints: View the Distance Learning Student Complaint Process (https://distance.ufl.edu/state-authorization-status/#student-complaint).

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. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Class demeanor

Opinions held by other students should be respected in discussion, and conversations that do not

contribute to the discussion should be held at minimum, if at all.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Additional comments regarding academic integrity:
Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

- Have another person complete a quiz in this course
- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

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.

Microsoft Office 365 Software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

Most problems, questions and concerns about the course will be resolved by professionally communicating with the instructors.

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

- Online Course: http://www.distance.ufl.edu/student-complaint-process.

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions maybe delayed.
If a student is lacking professionalism repeatedly, the instructor has the rights to file formal complaint against the student through the Dean of Student office.

Suggested Readings and Sources

Module 1

- Any General Microbiology Book: Chapters on bacterial transcription and gene regulation. In example:

- Diversity, versatility and complexity of bacterial gene regulation mechanisms: opportunities and drawbacks for applications in synthetic biology. Bervoets I, Charlier D. FEMS Microbiol Rev. 2019 May 1;43(3):304-339. doi: 10.1093/femsre/fuz001. PMID: 30721976

Module 2

- Transcription factor-based biosensors enlightened by the analyte. Fernandez-López R, Ruiz R, de la Cruz F, Moncalián G. Front Microbiol. 2015 Jul 1;6:648. doi: 10.3389/fmicb.2015.00648. eCollection 2015. PMID: 26191047

- Allostery in the LacI/GalR family: variations on a theme. Swint-Kruse L, Matthews KS. Curr Opin Microbiol. 2009 Apr;12(2):129-37. doi: 10.1016/j.mib.2009.01.009. Epub 2009 Mar 5. PMID: 19269243

- Phylogeny of the bacterial superfamily of Crp-Fnr transcription regulators: exploiting the metabolic spectrum by controlling alternative gene programs. Körner H, Sofia HJ, Zumft WG. FEMS Microbiol Rev. 2003 Dec;27(5):559-92. doi: 10.1016/S0168-6445(03)00066-4. PMID: 14638413

- Bacterial sensor kinases: diversity in the recognition of environmental signals. Krell T, Lacal J, Busch A, Silva-Jiménez H, Guazzaroni ME, Ramos JL. Annu Rev Microbiol. 2010;64:539-59. doi: 10.1146/annurev.micro.112408.134054. PMID: 20825354

- The three-component signalling system HbpS-SenS-SenR as an example of a redox sensing pathway in bacteria. Ortiz de Orué Lucana D, Groves MR. Amino Acids. 2009 Sep;37(3):479-86. doi: 10.1007/s00726-009-0260-9. Epub 2009 Mar 4. PMID: 19259771

- On prokaryotic intelligence: strategies for sensing the environment. Marijuán PC, Navarro J, del Moral R. Biosystems. 2010 Feb;99(2):94-103. doi: 10.1016/j.biosystems.2009.09.004. Epub 2009 Sep 23. PMID: 19781596

Module 3

- The repertoire of DNA-binding transcription factors in prokaryotes: functional and evolutionary lessons. Perez-Rueda E, Martinez-Nuñez MA. Sci Prog. 2012;95(Pt 3):315-29. doi: 10.3184/003685012X13420097673409. PMID: 23094327

- Dissecting the protein architecture of DNA-binding transcription factors in bacteria and archaea. Rivera-Gómez N, Martínez-Núñez MA, Pastor N, Rodriguez-Vazquez K, Perez-Rueda E. Microbiology (Reading). 2017 Aug;163(8):1167-1178. doi: 10.1099/mic.0.000504. Epub 2017 Aug 17. PMID: 28777072

- Abundance, diversity and domain architecture variability in prokaryotic DNA-binding transcription factors. Perez-Rueda E, Hernandez-Guerrero R, Martinez-Nuñez MA, Armenta-Medina D, Sanchez I, Ibarra JA. PLoS One. 2018 Apr 3;13(4):e0195332. doi: 10.1371/journal.pone.0195332. eCollection 2018. PMID: 29614096

Module 4

- RegPrecise 3.0--a resource for genome-scale exploration of transcriptional regulation in bacteria. Novichkov PS, Kazakov AE, Ravcheev DA, Leyn SA, Kovaleva GY, Sutormin RA, Kazanov MD, Riehl W, Arkin AP, Dubchak I, Rodionov DA. BMC Genomics. 2013 Nov 1;14:745. doi: 10.1186/1471-2164-14-745. PMID: 24175918

- P2CS: updates of the prokaryotic two-component systems database Philippe Ortet, David E. Whitworth, Catherine Santaella, Wafa Achouak, Mohamed Barakat Nucleic Acids Res. 2015 Jan 28; 43(Database issue): D536–D541. Published online 2014 Oct 16. doi: 10.1093/nar/gku968 PMCID: PMC4384028

- P2RP: a web-based framework for the identification and analysis of regulatory proteins in prokaryotic genomes Mohamed Barakat, Philippe Ortet, David E Whitworth BMC Genomics. 2013; 14: 269. Published online 2013 Apr 20. doi: 10.1186/1471-2164-14-269 PMCID: PMC3637814

Module 5

- Tools to map target genes of bacterial two-component system response regulators. Rajeev L, Garber ME, Mukhopadhyay A. Environ Microbiol Rep. 2020 Jun;12(3):267-276. doi: 10.1111/1758-2229.12838. Epub 2020 Apr 5. PMID: 32212247

- Functional Transcriptomics for Bacterial Gene Detectives. Perez-Sepulveda BM, Hinton JCD. Microbiol Spectr. 2018 Sep;6(5). doi: 10.1128/microbiolspec.RWR-0033-2018. PMID: 30215343

- A survey of best practices for RNA-seq data analysis. Conesa A, Madrigal P, Tarazona S, Gomez-Cabrero D, Cervera A, McPherson A, Szcześniak MW, Gaffney DJ, Elo LL, Zhang X, Mortazavi A. Genome Biol. 2016 Jan 26;17:13. doi: 10.1186/s13059-016-0881-8. PMID: 26813401

- Erratum to: A survey of best practices for RNA-seq data analysis. Conesa A, Madrigal P, Tarazona S, Gomez-Cabrero D, Cervera A, McPherson A, Szcześniak MW, Gaffney DJ, Elo LL, Zhang X, Mortazavi A. Genome Biol. 2016 Aug 26;17(1):181. doi: 10.1186/s13059-016-1047-4. PMID: 27565134.

- Rapid engineering of bacterial reporter gene fusions by using Red recombination. Gerlach RG, Hölzer SU, Jäckel D, Hensel M. Appl Environ Microbiol. 2007 Jul;73(13):4234-42. doi: 10.1128/AEM.00509-07. Epub 2007 May 18. PMID: 17513596

Module 6

- Tools to map target genes of bacterial two-component system response regulators. Rajeev L, Garber ME, Mukhopadhyay A. Environ Microbiol Rep. 2020 Jun;12(3):267-276. doi: 10.1111/1758-2229.12838. Epub 2020 Apr 5. PMID: 32212247

- Systematic characterization of protein-DNA interactions. Xie Z, Hu S, Qian J, Blackshaw S, Zhu H. Cell Mol Life Sci. 2011 May;68(10):1657-68. doi: 10.1007/s00018-010-0617-y. Epub 2011 Jan 5. PMID: 21207099

- Identifying and characterizing Hfq-RNA interactions. Faner MA, Feig AL. Methods. 2013 Sep 15;63(2):144-59. doi: 10.1016/j.ymeth.2013.04.023. Epub 2013 May 23. PMID: 23707622

Module 7

- High-Throughput Screening to Identify Chemoreceptor Ligands. Fernández M, Ortega Á, Rico-Jiménez M, Martín-Mora D, Daddaoua A, Matilla MA, Krell T. Methods Mol Biol. 2018;1729:291-301. doi: 10.1007/978-1-4939-7577-8_23. PMID: 29429099

- Insights into Protein-Ligand Interactions: Mechanisms, Models, and Methods. Du X, Li Y, Xia YL, Ai SM, Liang J, Sang P, Ji XL, Liu SQ. Int J Mol Sci. 2016 Jan 26;17(2):144. doi: 10.3390/ijms17020144. PMID: 26821017

- Surface plasmon resonance spectroscopy for characterisation of membrane protein-ligand interactions and its potential for drug discovery. Patching SG. Biochim Biophys Acta. 2014 Jan;1838(1 Pt A):43-55. doi: 10.1016/j.bbamem.2013.04.028. Epub 2013 May 9. PMID: 23665295

Module 8

- The study of protein-protein interactions in bacteria. Velasco-García R, Vargas-Martínez R. Can J Microbiol. 2012 Nov;58(11):1241-57. doi: 10.1139/w2012-104. Epub 2012 Oct 29. PMID: 23145822 https://cdnsciencepub.com/doi/pdf/10.1139/w2012-104

- A beta-galactosidase-based bacterial two-hybrid system to assess protein-protein interactions in the correct cellular environment. Borloo J, De Smet L, Vergauwen B, Van Beeumen JJ, Devreese B. J Proteome Res. 2007 Jul;6(7):2587-95. doi: 10.1021/pr070037j. Epub 2007 Jun 1. PMID: 17539672

- Yeast Two-Hybrid Assay to Identify Interacting Proteins. Paiano A, Margiotta A, De Luca M, Bucci C. Curr Protoc Protein Sci. 2019 Feb;95(1):e70. doi: 10.1002/cpps.70. Epub 2018 Aug 21. PMID: 30133175

- A Comparison of Two-Hybrid Approaches for Detecting Protein-Protein Interactions. Mehla J, Caufield JH, Sakhawalkar N, Uetz P. Methods Enzymol. 2017;586:333-358. doi: 10.1016/bs.mie.2016.10.020. Epub 2017 Jan 5. PMID: 28137570

Module 9

- Diversity, versatility and complexity of bacterial gene regulation mechanisms: opportunities and drawbacks for applications in synthetic biology. Bervoets I, Charlier D. FEMS Microbiol Rev. 2019 May 1;43(3):304-339. doi: 10.1093/femsre/fuz001. PMID: 30721976

- Two-Component Signal Transduction Systems of Pathogenic Bacteria As Targets for Antimicrobial Therapy: An Overview. Tiwari S, Jamal SB, Hassan SS, Carvalho PVSD, Almeida S, Barh D, Ghosh P, Silva A, Castro TLP, Azevedo V. Front Microbiol. 2017 Oct 10;8:1878. doi: 10.3389/fmicb.2017.01878. eCollection 2017. PMID: 29067003

- Transcription factor-based biosensors enlightened by the analyte. Fernandez-López R, Ruiz R, de la Cruz F, Moncalián G. Front Microbiol. 2015 Jul 1;6:648. doi: 10.3389/fmicb.2015.00648. eCollection 2015. PMID: 26191047
- Pharmacological manipulation of transcription factor protein-protein interactions: opportunities and obstacles. Fontaine F, Overman J, François M. Cell Regen. 2015 Mar 12;4(1):2. doi: 10.1186/s13619-015-0015-x. eCollection 2015. PMID: 25848531

- Drug Repurposing: Tolfenamic Acid Inactivates PrbP, a Transcriptional Accessory Protein in *Liberibacter asiaticus*. Gardner CL, Pagliai FA, Pan L, Bojilova L, Torino MI,

Lorca GL, Gonzalez CF. Front Microbiol. 2016 Oct 18;7:1630. doi: 10.3389/fmicb.2016.01630. eCollection 2016. PMID: 27803694

- The transcriptional activator LdtR from 'Candidatus Liberibacter asiaticus' mediates osmotic stress tolerance. Pagliai FA, Gardner CL, Bojilova L, Sarnegrim A, Tamayo C, Potts AH, Teplitski M, Folimonova SY, Gonzalez CF, Lorca GL. PLoS Pathog. 2014 Apr 24;10(4):e1004101. doi: 10.1371/journal.ppat.1004101. eCollection 2014 Apr. PMID: 24763829

Post-translational Modifications in Microbiology
MCB 6937
Summer C 2021

Rationale for course

The overall goal of this class is to enhance student learning in the field of microbiology and to network students with professionals within the scientific community. To this end, the course will take an innovative approach to student learning through interactive group projects and proposal writing. The students will prepare projects that will undergo a scientific review by their class peers and faculty instructors. Projects that pass the scientific review process will be made publicly available through Canvas with the ultimate-goal to provide a searchable web portal of post-translational modifications in microbiology. While proteomics and other systems biology approaches have facilitated the identification of a wide-variety of novel post-translational modifications, high-throughput data related to these modifications are not well synthesized and readily available to the scientific community (particularly data related to bacteria and archaea). This course will therefore serve as a resource to the scientific community. Students in the group will benefit from being listed as co-authors on the projects (with student permission). In addition to synthesizing published research findings, the group projects will require students to think 'outside the box'. One unique aspect of this course is the opportunity students have to learn the basics on writing their own research proposals. Students will identify gaps of knowledge requiring further investigation, elaborate their own research hypotheses and design experimental approaches to rigorously examine them. The research proposals will be 'scored' based on their significance, innovation, impact and scientific approach and rigor. We expect the student to take advantage of post-translational modifications to improve human health and the food, agricultural, and natural resources. Overall, this course is designed to provide an opportunity for students to not only learn about how post-translational modifications work but also start learning on writing proposals as a method to better understand a specific scientific field, and ultimately fund their own ideas and projects in the future. In this way, students will learn how they can better achieve their profession goals and, subsequently, serve our community.

Instructor

Mariola Edelmann, Ph.D.

Contact information: medelmann@ufl.edu, Department of Microbiology and Cell Science, office location Microbiology and Cell Science Bldg 981 Museum Rd., **Rm 1048**, office hours by appointment.

Preferred method for communication with the instructor regarding the course is Canvas message or e-mail (medelmann@ufl.edu)

Please resolve technical issues by contacting the UF helpdesk (e.g. http://helpdesk.ufl.edu (Links to an external site.); (352) 392-HELP (4357); *helpdesk*@ufl.edu · HUB 132).

Delivery Method/Meeting time

ALL ASSIGNMENTS, QUESTION /ANSWER SESSIONS, AND OTHER MATERIALS WILL BE AVAILABLE ONLINE ASYNCHRONOUSLY. Class discussion/review sessions will be held in

Canvas through ‘conferences’ for off-campus students to ask questions and interact with their instructor.

Credits - 2

Course Description

MCB 6937. Post-translational Modifications in Microbiology. Prereq: CHM 2211 (C) & (MCB 3020 or 3023) (C) & (MCB 3020L or 3023L) (C). Students will learn about post-translational modifications (PTMs) in microbiology. Topics will include: i) the different types, functions, and mechanisms of PTM, ii) the methods used to identify PTMs, and iii) the impact PTMs have on cell biology, human health, and biotechnology.

Course Objectives/Goals/Learning Outcomes

- To become knowledgeable on the molecular and cellular biology of post-translational modifications (PTMs)
- To gain the concepts and skills needed to understand and critically evaluate research articles that address PTMs
- To creatively apply knowledge of PTMs to current problems (*g.* controlling pathogenesis, sequestering carbon dioxide, engineering microbial biocatalysts in the production of renewable fuels and chemicals)
- To improve teamwork skills
- To utilize knowledge and skills in reviewing peer’s projects

Course Material and Assignments

All required course materials will be available through the Canvas e-Learning site (http://elearning.ufl.edu/). Instructions for and submission of assignments will also be through Canvas.

Assignments/Quizzes	**Deadline**	**Points**
Quiz 1	5/14	5 pts
Quiz 2	5/22	10 pts
Quiz 3	5/29	100 pts
Group project – division of work and 1-page draft of proposed project	5/29	25 pts
Group project - preliminary list of references (5 references per student)	6/06	20 pts

Group project - final written report	6/19	100 pts
Individual project – research proposal	7/9	100 pts
Scientific peer evaluation	7/16	100 pts
	Total:	460 pts
Extra credit (optional – resubmission of projects based on the comments)	8/6	25 pts

Written Group Project (100 points for final report):

Students will be assigned to groups by the instructors and tasked with gathering and synthesizing information for a specific type of post-translational modification from the list below (see *List of post-translational modifications for group projects*). The students should focus on the post-translational modifications that occur on **proteins** (and not DNA or lipids) in **ARCHAEA** or **BACTERIA**. Alternatively, the focus of the project could be on the post-translational modifications that occur on host or bacterial proteins that are catalyzed by enzymes from bacterial pathogens.

List of possible post-translational modifications for group projects

1. Phosphorylation
    1. Arginine
    2. Serine/Threonine and Tyrosine
    3. Histidine and Aspartic Acid
2. ADP-ribosylation
3. Methylation
4. Glycosylation
5. Acetylation (Nα- and Nε-acetylation)
6. Lipidation
7. S-Nitrosylation and S-Sulfhydration
8. S-Glutathionylation
9. Methionine oxidation – as a reversible process
10. Uridylylation
11. Adenylylation
12. Unique modifications of translation elongation factors (including attachment of ethanolamine phosphoglycerol, diphthamide and hypusine)
13. Ubiquitin-like modifications (sampylation, pupylation)
14. Ubiquitin modification in Eukaryota catalyzed by bacterial (pathogen) enzymes
15. Targeted proteolysis (select a regulatory protease – *g*., Clp, Lon, Proteasome)
16. Specific polypeptide cleavage (*g.,* removal of signal peptides)

The students will gather, synthesize, and present information on the post-translational modification in format as outlined below.

Templates (in Excel and MS word) and a PowerPoint lecture are posted in the Modules section of Canvas that provide instructions to guide students on how to properly organize and complete the written portion of the group project. The overall aim of the written project is to assist the student in learning how to properly gather, synthesize, and write a well-rounded summary that provides the reader with a complete understanding of a specific type of post-translational modification in microbiology. The written project includes proposal (XI), to which all students should contribute.

The templates (posted in Canvas and based on the ***"Required aspects of the post-translational modification paper"*** listed below) are designed to aid the student in developing a proper outline that will help guide the writing of a paper that is of high scientific quality. The summary paper should include 15 to 20 pages of material. A title page and appropriate figures/tables are required. Three Supplementary Tables 1-3 are required (see list below) and should include the modified protein name, modified protein Accession Number, modified residue (including amino acid position if known), enzymes which catalyze this modification and appropriate reference(s) (according to the Excel template posted in the Modules section of Canvas). References are required and should be included on additional pages (no page limit). Font requirements are the following: 1-inch margins, font size must be 11 points (smaller text is acceptable in figures, graphs, diagrams, and charts). The paper must be uploaded through Canvas e-learning. This paper will be scanned by TurnItIn for plagiarism. Please see the final page of the syllabus for details on the **UF policy regarding plagiarism**. Contact us if you have doubts what constitutes plagiarism. Each student will be **graded individually** (not as a single group grade) for the contributions they have made to the group project. **Each student must contribute to at least one of the Supplemental Tables listed below.** Students are required to list their name on the portions of the written project (including the supplemental Tables) for which they have contributed.

Required aspects of the post-translational modification paper:

Title

Student Name, Department of Microbiology and Cell Science, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, Florida, USA.

1. Definition.

2. Detailed chemistry.

3. Overview of the attachment and removal of the post-translational modification from target proteins.

4. Details on protein factors of the post-translational modification including enzyme(s) catalyzing the addition and removal of the post-translational modification (summarized below and in Supplementary Table 1).

5. General distribution/function of protein modification among the three domains of life (for details on the distribution of protein homologs associated with the post-translational modification pathway see Supplementary Table 2).

6. Detailed list of known protein targets (and affected residues). A detailed list of known protein targets is compiled from references x, y and x and summarized in Supplementary Table 3.

7. Biological function of post-translational modification.

8. Methods used to detect and map the site(s) of post-translational modification.

9. Insight into how this post-translational modification may benefit human health and and/or the food, agricultural, and natural resources.

10. Quote obtained from a scientist about the post-translational modification of choice.

References

Tables. (be sure to state if table is original or include citation and a statement that the table is from a publication)

Figures. (be sure to state if figure is original or include citation and a statement that the figure is from a publication)

Supplementary Table 1. Protein factors of the assigned post-translational modification (PTM) pathway. Note that the protein factors are defined as the enzymes that add and remove the post-translational modifications and the modification if it is a protein modifier such as ubiquitin, SAMP, Pup, etc.

Supplementary Table 2. Phylogenetic distribution of the protein factors of the assigned protein modification system.

Supplementary Table 3. Known protein targets (and affected amino acid residues) of the assigned post-translational modification pathway.

Be sure to include page numbers at the bottom of each page of your project paper

Outline of research proposal (100 points):

Each student will write a research proposal based on the chosen modification (most likely the one which was a subject of his/her group project) and use the published papers as the basis for a novel grant/research proposal. Each proposal will be **2-3 pages in length** (plus additional pages for references) and consist of the following **sections**:

1. **Introduction**

A brief review of the relevant literature should be presented (can be synthesis of the written group project but individual input is required).

2. Background and Significance

In this section, the relevant preliminary data from the chosen papers will be described. The major outstanding questions that arise from this work and that will form the basis for the proposed studies should then be stated. The rationale for further studies should be described (i.e. what is the importance of answering the stated questions, including the clinical significance? What new understanding will be gained? How will this impact science and/or medicine?).

3. Central hypothesis

A succinct hypothesis should be formulated and stated which is based on the evidence presented in the Background and Significance section. For example:

Based on the evidence host-mediated Asparagine (Asn) hydroxylation of Legionella pneumophila effectors by host asparagine hydroxylase, FIH, is required for their functions in biogenesis of the Legionella-containing vacuole (LCV) and intracellular proliferation of Legionella pneumophila.

4. Specific Aims

You should propose **2-3 specific aims** which each represent a series of experiments which will test aspects of your central hypothesis. For example, possible specific aims arising from the hypothesis stated above:

Aim 1. *Asn hydroxylation of AnkH effector and its role in the intracellular infection*

Aim 2. *Asn hydroxylation of AnkB effector and its role in the intracellular infection*

Aim 3. *Asn hydroxylation of other Legionella pneumophila effectors and its role in biogenesis of the Legionella-containing vacuole*

5. Research Design and Methods

Here you will describe the actual experiments that you will perform in each aim. You will be describing in a logical way experiments you plan to address in each aim. You may need to add alternative approaches (experiments) in case the first set of proposed experiments fail. This section should be broken into three separate sections, one for each aim. What will define the success or failure of your proposal and what metrics need to be considered to determine the significance of your observations

Scientific Peer Evaluation of written project (100 points):

Each student will provide an independent scientific review (500-700 words) of one of the assigned projects that were written by their peers. The reviews should include: i) a written summary about each modification, ii) a critical evaluation of the strengths/weaknesses of the written project with appropriate scientific rationale (focus on each of the scientific criteria listed below – do not simply comment on the presentation style), and iii) scores (1 highest – 9 lowest) for each of the following criteria:

- Significance
- Impact
- Innovation
- Approach and scientific rigor

Examples of literature to get you started

Overview

- (Cain et al., 2013)
- (Eichler and Maupin-Furlow, 2013)
- (Bastos et al., 2016)

Phosphorylation

- (Esser et al., 2016)
- (Trentini et al., 2016)

Ubiquitin-like modifications (sampylation, pupylation)

- (Maupin-Furlow, 2014)

Acetylation (Nα- and Nε-acetylation)

- Lysine (Ouidir et al., 2016)
- N-terminal modifications (Giglione et al., 2015)

Methylation

- Lysine (Lanouette et al., 2014)

Lipidation

- (Nakayama et al., 2012)

Glycosylation

- (Schaffer and Messner, 2016)

Methionine oxidation – as a reversible process

- (Drazic and Winter, 2014)

S-Nitrosylation and S-Sulfhydration

- (Lu et al., 2013)

S-Glutathionylation

- (Grek et al., 2013)

Uridylylation

- (Merrick, 2014)

Adenylylation

- (Itzen et al., 2011)

Unique modifications of translation elongation factors

- (Greganova et al., 2011)

Targets of regulated protein turnover by Clp, Lon, proteasome, etc.

- (Gur, 2013)

Specific polypeptide cleavage

- (Berry et al., 2016)

Weekly Course Schedule

Week 1

- Introduction to course and syllabus
- Example of ideal group project – presented by faculty instructor
- Chat meeting with an instructor to answer any questions (week 1, week 8)
- **Quiz 1**: what do I know about proteins? (5 points for participation, not graded, 05/15)

Week 2

- **Quiz 2**: syllabus content and example of ideal group project (10 points, 05/22)
- Overview of the different types of post-translational modifications found in bacteria and archaea – study the content of the module for Quiz 3 in week 3
- Assignment of students to group projects (based on student ability assessed by Quiz 1)
- Students work on group projects

Week 3

- **Quiz 3**: Overview of the different types of post-translational modifications found in bacteria and archaea (100 points, deadline – 05/29)
- Students work on group projects
- Group project – division of work and 1-page draft of the proposed document indicating division of work (25 points, deadline – 05/29)

Week 4

- Students work on group projects

- Group project – at least five references per student (individual submissions please) related to group project (20 points, deadline – 06/05)

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Week 5

- Students work on group projects
- Advice on writing individual project, meeting on June 8, 9-10AM

Week 6 (6/15- 6/19)

- Group project – students work on written report, written report due at end of week (deadline - 06/19)
- Identify subject for individual project due in week 9 (no submission needed, emails encouraged)

Week 7

- Summer break – no classes

Week 8

- Students work on individual project

-

Week 9

- Individual project – research proposal due at end of week (deadline - 07/9)
- assignment of papers for peer-evaluation

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Week 10

- scientific feedback from instructors
- selection of projects for online publication (if any)
- scientific peer evaluation of projects (deadline - 07/16)

Week 11-12

- grading
- students work on modification of written report/proposals based on recommendations

Week 13

- student modification of written report/proposals based on instructor recommendations (resubmit by **8/6, 25 extra credit points**)

[Exam Dates/Calendar/Critical dates and deadlines]

Deadlines

Quiz 1 05/15

Quiz 2 05/22

Quiz 3 05/29

Group project - division of work and 1-page draft of the proposed project 05/29

Group project – preliminary list of references 06/05

Group project - written report 06/19

Individual project – research proposal 07/9

Scientific peer evaluation - 07/16

Resubmission - 08/6 (optional)

Evaluation of Learning/Grades

MCB 6937 learning will be evaluated based on the following criteria:

5 points	Quiz 1
10 points	Quiz 2
100 points	Quiz 3
25 points	Group project - division of work and 1-page draft (in bullet points) of the proposed project
20 points	Group project – preliminary list of references
100 points	Group project - written report
100 points	Individual project – research proposal
100 points	Scientific peer evaluation

460 points total

+ 25 points optional (extra credit)

Materials and Supplies Fees

There are no additional fees for this course.

Grading Policy

Final grades will be based on the following performance standard:

95 -100 %	=	A
90 - 94.9 %	=	A-
87 - 89.9 %	=	B+
84 - 86.9 %	=	B
80 - 83.9 %	=	B-
77 - 79.9 %	=	C+
74 - 76.9 %	=	C
70 - 73.9 %	=	C-
60 - 69.9 %	=	D
Less than 60.0 %	=	E

More information on grades and grading policies is here:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Class Attendance and Make-Up Policy

Class attendance and make-up policies are according to the university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx).

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance:

Health and Wellness

- *University Counseling & Wellness Center*, 3190 Radio Road, 352-392-1575,

www.counseling.ufl.edu/cwc/ (Links to an external site.)

- Counseling Services
- Groups and Workshops
- Outreach and Consultation
- Self-Help Library
- Wellness Coaching

- U Matter We Care, www.umatter.ufl.edu/
- *Career Resource Center*, First Floor JWRU, 392-1601, crc.ufl.edu/ (Links to an external site.)

Emergencies

For emergencies call: University Police Department, 392-1111 (or 9-1-1 for emergencies).
http://www.police.ufl.edu/

Academic Resources

- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.
- Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://www.crc.ufl.edu/
- Library Support, http://cms.uflib.ufl.edu/ask. 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. http://teachingcenter.ufl.edu/
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. http://writing.ufl.edu/writing-studio/

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. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/ (Links to an external site.)

Class demeanor

Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.

http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

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 (https://www.dso.ufl.edu/sccr/process/student-conduct-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.

Microsoft Office 365 Software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/ (Links to an external site.)

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

Most problems, questions and concerns about the course will be resolved by professionally communicating with the instructor or the TAs.

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact

- Residential Course:

https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf (Links to an external site.).

- Online Course: http://www.distance.ufl.edu/student-complaint-process (Links to an external site.).

University of Florida U Matter

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 911.

Plagiarism

Please note that plagiarism is against the UF honor code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/ (Links to an external site.)

"(a) **Plagiarism**. A student shall not represent as the student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution."

You must use your own words to communicate oral and written materials presented in the oral reports, scientific evaluations, and summaries of this course.

Online modules are available to assist you with making ethical decisions regarding plagiarism and other codes of conduct at https://www.dso.ufl.edu/sccr/seminars-modules/ (Links to an external site.) .

References for Reading Material and Writing Assignments

Bastos, P.A., da Costa, J.P., and Vitorino, R. (2016). A glimpse into the modulation of post-translational modifications of human-colonizing bacteria. J Proteomics *152*, 254-275.

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Human Genomics

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Course Description

Increasingly, researchers and health care providers are mining the genome to uncover the basis of disease susceptibility and treatment. Genome-based strategies are used for the detection, treatment, and prevention of many diseases. This course will discuss the field of genomics, how genome sequence data is obtained and analyzed, and most importantly, what can be learned from an individual's genome. Students will conduct genomics research by working with human genome data and conduct a small analysis of associations between genetic variants and the diet. The course will address cutting-edge research in epigenetics, pharmacogenomics, molecular diagnostics, and the microbiome. The course will also include timely topics such as GMO's, stem cells, genetic testing and genome editing. This course will reinforce fundamental concepts in molecular biology and genetics.

The course will be entirely web-based, and all lectures will be delivered online and asynchronously. The reading assignments, course lecture materials and online activities will be posted each week. There will be a quiz each week over module's material.

Course Objectives

The goals of this course are:

1. To reinforce a solid foundation in molecular biology in order to fully understand how the genome determines traits, including susceptibility to disease.
2. To understand the role of the genome in the development, detection, prevention and treatment of disease.
3. To conduct and interpret basic genomics research approaches and outcomes.
4. To appreciate how advances in biotechnology and genomics are personalizing all aspects of medicine including prevention, diagnostics, and treatment.
5. To frame and to participate in broader discussions of the ethics and complexities of this era of biotechnology and precision medicine.

Course Requirements

Recommended textbook

The textbook is recommended but not required. Genetics From Genes to Genomes by Hartwell, Goldberg, Fischer, Hood. 7th Edition. Published by McGraw Hill, 2021.

Other online resources will be posted.

Minimum technology requirements

The University of Florida expects students to acquire computer hardware and software appropriate to his or her degree program. Most computers are capable of meeting the following general requirements. A student's computer configuration should include:

- Webcam
- External Camera - will be sent to you
- Microphone
- Broadband connection to the Internet and related equipment (Cable/DSL modem)
- Microsoft Office Suite installed (provided by the university)

Individual colleges may have additional requirements or recommendations, which students should review prior to the start of their program.

Please refer to the Student Computing Requirement policy from UF: **https://it.ufl.edu/policies/student-computing-requirements/ (https://it.ufl.edu/policies/student-computing-requirements/)**

Access to and on-going use of a computer is required for all students. Competency in the basic use of a computer is require.

For more info and to receive your external camera, please read the **External Camera** document.

Honorlock

Honorlock is an online proctoring service that allows students to take exams on-demand 24/7. There are no scheduling requirements or fees.

You will need a laptop or desktop computer with a webcam, a microphone, and a photo ID. The webcam and microphone can be either integrated or external USB devices.

Honorlock requires that you use the **Google Chrome (https://www.google.com/chrome/)** browser; furthermore, the Honorlock extension must be added to Chrome.

For further information, FAQs, and technical support, please visit **Honorlock. (http://Honorlock.com/students)**

Zoom

Zoom is an easy to use video conferencing service available to all UF students, faculty, and staff that allows for meetings of up to 100 participants.

You can find resources and help using Zoom at **https://ufl.zoom.us (https://ufl.zoom.us)**.

Assessments

Exams

Three proctored, non-cumulative exams will be administered throughout the semester. Each exam is worth 18% of your grade. All exams will be proctored. If an exam is taken without approved proctoring arrangements and without adhering to proctoring criteria (eyes only on the screen, closed book/notes, no talking or other devices, etc) credit will not be given and the score will be a zero. If it is detected that a student's LMS account was signed into by more than one instance during an exam (i.e., two individuals signed into the same student account during an assessment), credit will not be given and the score will be zero.

An optional, final exam will be given during finals week. The exam will be cumulative and can be used to replace a lower in term exam.

Exam windows will be open for 4 days. Because of the expanded windows, there is no possible conflict with exams from other courses. The windows will open at 8 AM EST and close at 11:59 PM EST. If you live in a different time zone please take this into account. Canvas will cut your exam off at 11:59 PM Eastern Standard Time.

Exam Windows:

Exam 1 - Sept 29 - Oct 2 ; Modules 1 - 5

Exam 2 - Nov 3 - Nov 6; Modules 6 - 10

Exam 3 - Dec 3 - Dec 6; Modules 11 - 14

Optional cumulative final exam - Dec 11 - 14

Quizzes

Brief quizzes will be assigned for each module. Quizzes can be taken up to **two times each** and only your highest score per quiz will be recorded for a grade. Your quiz average will count for **15%** of your final grade. Quizzes cannot be taken late so missed quizzes will count as a zero and can count towards a quiz drop. However, to enhance flexibility and give a little breathing room, the 5 lowest quiz grades will be dropped. The quiz window closes once the due date passes so students will not have access to quizzes if they have not been attempted at least once.

One of the quizzes is a syllabus quiz to make sure the policies and format of the course are understood. Another quiz is an Honorlock practice quiz to ensure students understand the process to take an assessment with Honorlock. The Honorlock quiz is required and may not be dropped.

Assignments

There will be 3 - 5 assignments worth 23% of the final grade. Instructions will be given in class. The assignments are activities in which students analyze real genomic data from an ongoing study to identify associations between genetic variants and dietary traits. The students will then use online tools and resources, including those from NCBI and the primary literature to synthesize a biological hypothesis to support their associations and to contribute to the field of genomics.

Discussion/Participation

Students will receive points for participation in Discussion Boards on Canvas. Points will be awarded according to rubrics included in the individual Discussion Board details and this is worth 3% of the course grade.

Class Project

A group project presentation will be worth 5% of your final grade. More details will be provided in class. Students will collaborate on a presentation that summarizes their research work for the semester.

Grading Policy

I will make every effort to have each assignment posted and graded within 10 days of its due date.

Point Adjustment Requests

Once an assessment is graded and returned, you have 10 calendar days to contest your grade in an email. Any requests for points must include a clear justification of your response and why it is as complete or better than the correct one.

Please note that questions and comments about any quiz/exam question are welcome at any time during the semester for the purposes of understanding and education.

Course Grading Policy

Assessment	Value of Total Grade
Exams (3 total)	54%
Course Project	5%
Quizzes	15%
Assignments	23%
Discussion/participation	3%
	100%

Grade Scheme

The cutoffs for letter grades will be as follows:

Grade	Range
A	100 % to 93.0%
A-	< 92.99 % to 89.0%
B+	< 88.99 % to 86.0%
B	< 85.99 % to 82.0%
B-	< 81.99 % to 79.0%
C+	< 78.99 % to 76.0%
C	< 75.99 % to 72.0%
C-	< 71.99 % to 69.0%
D+	< 68.99 % to 66.0%

Grade	Range
D	< 65.99 % to 62.0%
D-	< 61.99 % to 59.0%
E	< 58.99 % to 0.0%

*Grade rounding will be done as outlined above. (for example, a final grade of 81.95 is a B-)

** It is recommended that you use your own calculations during the semester to get an estimate of your grade.

Please see the UF grading policies at this site: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Attendance/Participation Policies

Requirements for class attendance and make-up exams and assignments in this course are consistent with university policies that can be found at: catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Makeup exams will be provided for students who miss an exam due to documented circumstances that are consistent with the excused absences described in the university policy. Because the exam window will be open a minimum of 48 hours, it is not possible for exam overlap with exams from another course.

Course Structure and Flow

Login to Canvas, select this course, and then go to the “Start Here” Module. This module will highlight all the important policies, features, and flow of the course. I’ve included an intro video of myself too so you can get to know me.

New modules are posted each week of the semester. For each module, there will be several items to complete. Click on the link for each item. The first item will always list the **learning objectives.** Keep these in mind as you learn the material. After reading the learning objectives, please go through the material in the order presented. The next item in the list will usually be the reading assignment, followed by the lectures, and links to any online tutorials or modules. After you go through the material in the order presented, you are always free to return and visit any of the content. The welcome video will give an example of the types of course content and how it will be presented. The pdf of the lecture slides of each module will also be posted for your convenience. This convenience is

for students who wish to print out the slides and follow along with the lecture, study the notes later, etc. The lectures slides will only be available in pdf format.

Each module includes a quiz. The quizzes are due on the last day of the module week by 11:59 PM. The material will be available to you throughout the semester, but once a quiz due date passes, this means that you can no longer access the quiz. If you only attempt a quiz once before due date, that quiz grade is the only one that will count. (See below for more info on quizzes).

List of Topics - *Subject to Change*

UF Policies

University Policy on Accommodating Students with Disabilities:

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, **https://disability.ufl.edu/** **(https://disability.ufl.edu/)**) by providing appropriate documentation. Once registered, students will receive an accommodation letter that must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

University Policy on Academic Conduct:

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 honesty 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 (**http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/** **(http://www.dso.ufl.edu/sccr/process/student-**

conduct-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.

Additional Statement on Course Decorum:

Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following violate the student honor code:

- Have another person complete a quiz/assessment in this course
- Copy another student's work in this course
- Collaborate with anyone while working on a quiz or assessment in this course unless told otherwise
- Discuss the questions and answers with other students while the assessment window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).

Netiquette and Communication Courtesy:

All members of the class are expected to follow **rules of common courtesy** (https://ufl.instructure.com/courses/411643/files/52022329/download?download_frd=1) in all email messages, threaded discussions, and chats.

Tips for Success

- After teaching online for 10 years, I've accumulated some tried and true tips for success in an online course. These are real tips from my past students:
  - Schedule "class times" for yourself. It is important to do the coursework on time each week.
  - Read ALL of the material contained on this site. There is a lot of helpful information that can save you time and help you meet the objectives of the course.
  - Do not wait to ask questions! Waiting to ask a question might cause you to miss a due date.
  - Don't wait for the last minute. Even a little bit a deadline anxiety can affect your performance. Give yourself some breathing room.
  - Always have a backup plan: do you have the power cord ready in case your battery goes down in the middle of an exam? What if your internet is out on the day of any exam?

- Use the learning objectives to study! (of students who regularly use the learning objectives, 100% said they were extremely helpful and valuable).

Course Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at **https://gatorevals.aa.ufl.edu/students/ (https://gatorevals.aa.ufl.edu/students/)** . 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 **https://ufl.bluera.com/ufl/ (https://urldefense.proofpoint.com/v2/url?u=https-3A__ufl.bluera.com_ufl_&d=DwMFAg&c=sJ6xIWYx-zLMB3EPkvcnVg&r=y2HjEMjRMHJhfdvLrqJZlYczRsfp5e4TfQjHuc5rVHg&m=WXko6OK_Ha6T00ZVAsEaSh99qRXHOgMNFRywCoehRho&s=itVU46DDJjnIg4CW6efJOOLgPjdzsPvCghyfzJoFONs&e=)** . Summaries of course evaluation results are available to students at **https://gatorevals.aa.ufl.edu/public-results/ (https://gatorevals.aa.ufl.edu/public-results/)** .

Canvas Information

Canvas is where course content, grades, and communication will reside for this course.

- ufl.instructure.com
- For Canvas, Passwords, or any other computer-related technical support contact the IT Service Desk.
  - 123 123-1234
  - 877 878-8325
  - http://it.myinstitution.edu
  - **itsupport@myinstitution.edu (mailto:itsupport@myinstitution.edu)**

Getting Help

Technical Difficulties:

For issues with technical difficulties for Canvas, please contact the UF Help Desk at:

- **http://helpdesk.ufl.edu (http://helpdesk.ufl.edu)**
- (352) 392-HELP (4357)
- Walk-in: HUB 132

Any requests for make-ups due to technical issues should be accompanied by the ticket number received from the Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You should e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Health and Wellness

- **U Matter, We Care**: If you or someone you know is in distress, please contact **umatter@ufl.edu (mailto:umatter@ufl.edu)** , 352-392-1575, or visit **umatter.ufl.edu (http://umatter.ufl.edu)** to refer or report a concern and a team member will reach out to the student in distress.
- **Counseling and Wellness Center:** Visit **counseling.ufl.edu (http://counseling.ufl.edu)** or call 352-392-1575 for information on crisis services as well as non-crisis services.
- **Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit **shcc.ufl.edu (http://shcc.ufl.edu)** .
- **University Police Department**: Visit **police.ufl.edu (http://police.ufl.edu)** or call 352-392-1111 (or 9-1-1 for emergencies).
- **UF Health Shands Emergency Room/Trauma Center:** For immediate medical care in Gainesville, call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; **ufhealth.org/emergency-room-trauma-center (http://ufhealth.org/emergency-room-trauma-center)** .

Academic and Student Support

- **Career Connections Center:** 352-392-1601. Career assistance and counseling services **career.ufl.edu/ (http://career.ufl.edu/)** .
- **Library Support:** Various ways to receive assistance with respect to using the libraries or finding resources. **cms.uflib.ufl.edu/ask (http://cms.uflib.ufl.edu/ask)**
- **Teaching Center:** 352-392-2010 General study skills and tutoring: **teachingcenter.ufl.edu/ (http://teachingcenter.ufl.edu/)**
- **Writing Studio:** 352-846-1138. Help brainstorming, formatting, and writing papers: **writing.ufl.edu/writing-studio/ (http://writing.ufl.edu/writing-studio/)**

☑ Online Proctoring

In order to maintain a high standard of academic integrity and assure that the value of your University of Florida degree is not compromised, course exams will be proctored. Some students will take their exams online and will be proctored by Honorlock. You will take your exam electronically using the course website. You **do not** need to register for your exam. However, you will need to have installed and enabled the Google Chrome Honorlock extension prior to taking your exams. You will need a webcam, speakers, external camera, microphone, laptop or desktop computer, and reliable Internet connection to be able to take your exams. Wireless internet is not recommended. You may also need a mirror or other reflective surface. Google Chrome is the only supported browser for taking exams in Canvas.

UF is committed to the integrity of your degree. An important part of protecting integrity is to proctor exams whether they be in-person or online. For online exams, the Microbiology and Cell Science Department has preliminary evidence that external cameras detect and deter cheating at far higher rates than a simple webcam on a computer. We need to continue this experiment to be more confident in this result. We expect external cameras will protect your degree. We are also confident that the vast majority of our students do not cheat during online exams. Our work is intended to benefit those students who do the right thing.

You are part of a pilot project using a USB external wide-angle camera for distance proctoring within the Microbiology & Cell Science department during fall semester, 2021. For this pilot your camera will be provided free of charge and is yours to keep.

Please provide the shipping address where you wish to receive your camera via this Gatorlink authenticated page by Monday 8/30/21: **https://forms.gle/dQ1JwWaTVPNH7Zzy7 (https://forms.gle/dQ1JwWaTVPNH7Zzy7)**

Before Your Exam

Prior to each exam and in the same environment you plan to take the exam, review the **Honorlock Guidelines (https://static.honorlock.com/assets/2017/students/HonorlockGuidelines.pdf)**, and go to **Honorlock Support (https://honorlock.com/support/)** to run a system check. This process takes just a few minutes and is completely free. If your course offers an Honorlock Practice Quiz, it is strongly recommended that you take it to practice using Honorlock before your exams.

Important: If you are unable to take an exam because of a technical glitch on your end, that is your responsibility. However, if you do experience technical difficulties during the exam, Honorlock's support menu will visible on-screen for you to contact a support agent.

Getting Help

Honorlock offers 24/7/365 technical support to assist students before, during, and after exams. If you experience any trouble with Honorlock, begin a live chat on the **Honorlock Support page (https://honorlock.com/support/)** , call +1 (844) 243-2500, or email **Support@Honorlock.com (mailto:Support@Honorlock.com)** .

The Microbiome – Spring 2020
MCB 4320C and MCB 6670C
3 credit hours

Brief Background: This course has introductory microbiology (MCB 3020 or MCB 3023 or equivalent) as a prerequisite with a minimum grade of C and is intended for majors in the Life Sciences. It will be taught at the senior level and its primary objective is to increase genomics knowledge and appreciation. Environmental microbiologists began the study of uncultured microbial life in the early 1990s. The idea was to begin to understand the breadth of microbial diversity across a wide variety of habitats using methods that do not require culturing of the organisms.

During this period, the explosion in technology and data analysis also began in genomics. Environmental microbiologists took full advantage of these new tools and were able to find diverse life in many places. By about 2005, those outside of microbiology began to take notice of these new tools and became interested in discovering microbes associated with their environments of interest. That included biomedical scientists, ecologists, agriculturalists, taxonomists, entomologists, and others. This has led to a sea of papers in the field including and explosion of papers on the collection of microbes in association with eukaryotes.

What is the microbiome? The collection of microorganisms that inhabit a specific environment is referred to as the microbiome. The microbiome includes all microbial life: bacterial, archaeal, fungal, and viral. Microbiomes exist on and within plants, animals, insects, amphibians, birds, etc. They also exist in niches to themselves in a wide variety of terrestrial, marine, and aquatic environments. Many of these environments are extreme including hot springs, deep ocean thermal vents, and subsurface rock formations.

Given the many environments in which microbiomes thrive, no single course or group of courses can hope to cover them adequately. But this course intends to teach students many of the modern tools available to analyze the microbiome and its role in a given environment. As a result, this course will provide students with experience using many of the molecular tools used in microbiome analysis including 16S rRNA sequencing, whole genome sequencing, and epigenomics. Some lessons learned on experimental design will also be included.

In this course, active learning will be encouraged. That is, the course will be focused on an on-going microbiome experiment with a specific research question in mind. This question and its importance will be addressed in the first week of the course. In succeeding weeks, students will learn those approaches, methods, and technologies needed to address the question. More subsidiary questions may arise as the work progresses, as commonly occurs with any research project.

The course will be entirely web-based, and all lectures will be delivered online. The reading assignments, course lecture materials and online activities will be posted each week. There will be three exams and six quizzes in this course. There will also be a final

report due on the microbiome project conducted during the course. Graduate students will be asked to write a review on the current literature on a microbiome topic.

Instructors:

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Zoom: https://ufl.zoom.us/j/350304793
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Jordan Russell, Current PhD student in the Triplett lab
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Other graduate students from the Triplett lab will give lectures on the technologies they are using that apply to the microbiome.

The best ways to contact us is via E-learning mail or we can set up a time for individual phone calls zoom sessions.

Course Objectives:
1. Students will discover how to design and conduct a human cohort observational trial for addressing a specific question. The advantages and limitations of such trials will be discussed.
2. Students will be introduced to how microbial omics data is used to understand the human microbiome and its role in human health.
3. Students will be introduced to the modern technologies used in microbiome research. By understanding the technologies, the students can learn which biological questions can be asked and answered given today's tools.
4. Students will learn students how to analyze those omics datasets often used in microbiome analysis.
5. Genome mining will be covered so that students can be recover a genome sequence from sample data containing many genomes.
6. The microbiome in many environments will be discussed including the analysis of microbial communities in the environment.
7. Students will participate in the analysis and interpretation of an on-going microbiome experiment and write a report on their results.
8. In addition to all of the requirements of the undergraduate course, students in the graduate section will be required to write a review on the role of the microbiome in any biological system.

e-Learning system: The course will be managed entirely through the e-Learning in the Canvas system (one of two big orange button at https://elearning.ufl.edu/). If you are not familiar with this system, you need to become acquainted with it for this course. The LSS homepage contains tips and tutorials for students as well as computer requirements. It is your responsibility to become familiar with e-Learning in Canvas and to ensure that you have the appropriate browsers, settings, internet speed, etc. For any technical questions regarding Canvas, please visit the elearning site (https://elearning.ufl.edu/help/Student_Faq) and/or the UF Help desk (http://helpdesk.ufl.edu/). They can address technical issues such as not being able to view course materials, not being able to access the quizzes, not being able to send mail, etc. **All technical issues/questions/comments should go to the Help Desk first (352-392-HELP).** They are the experts. The Help Desk suggests that if you encounter any problem (error messages, etc.) that you take a screen shot of the problem and save it. This will help the Help Desk in fixing your problem.

If you encounter a problem that the HELP DESK cannot fix, please send a help request to the Technical Support Center of the Microbiology & Cell Science Department. Please fill out your request at http://microcell.ufl.edu/support/index.php. The form will ask for your name, number, email and location. In the location field, please indicate "online course."

Office Hours: Since this is a web-based course, office hours will be online. The office hours will be conducted via the Meetings function in e-Learning in Canvas or zoom. Office hours are difficult to schedule since our students have such varied schedules. We will always be available to answer questions by email or to set up an individual phone or zoom conversation. Just contact us to arrange.

Email and Announcements: All email communication regarding this course will be done through the mail function of E-learning in Canvas. This mail system is private and secure. It is your responsibility to check your E-learning Mail and Announcements **frequently** to stay updated on the course. Please check the course a minimum of two times per week to be certain that you are not missing any important communications. As the instructors, we will respond to your questions and emails promptly. By maintaining all email communication through Canvas instead of other email domains, it reduces the chance that discussions will get lost among outside accounts. When sending an email through e-Learning in Canvas, you have the option to also forward the email to the recipient's ufl account. Please use this option if you have an urgent message. If you receive a course email (from Canvas) to your ufl account, please note that you cannot simply hit "reply" to the email. You must login to Canvas to respond through the mail function.

Topical outline of weekly modules (all times Eastern):

Wk	Dates	Topic for week:
1	Jan 6 - 10	Introduction to Course History of the study of the microbiome Introduction to the course's microbiome project

		Introduction for the graduate students
2	Jan 13 – 17	What factors are considered in establishing a human cohort for a microbiome observational trial?
		Design, IRB approval, privacy, safety, de-identification, maximizing enrollment, organizing data generation and analysis. The question is the focus: to what extent does human genotype regulate the bacteria in your mouth?
3	Jan 21 - Jan 24	Course project design - data collection and organization.
		What are the datasets needed to answer this question?
4	Jan 27 - Jan 31	Bacterial identification in the microbiome
		Exam 1, January 29, 2 PM to January 31, 11:59 PM
5	Feb 3 - 7	16S rRNA data analysis and interpretation
6	Feb 10 – 14	What bacterial functions are present in these samples? How do they differ with diet and depression? Metagenomics.
		List of references from graduate students due February 10 at 5 PM.
7	Feb 17 – 21	Is the microbiome associated with student depression?
		With data analysis and interpretation.
8	Feb 24 - Feb 28	Extracting whole genomes from the microbiome.
		Exam 2, February 26, 2 PM to February 28, 11:59 PM
9	Mar 9 - 13	Are diet and depression associated? Includes data analysis and interpretation.
		An outline of the review to be written by the graduate students is due March 16 at 5 PM
10	Mar 16 - 20	Human genetics as a driver for microbiome composition and diet: you eat what you are.
11	Mar 23 - Mar 27	Human genetics and microbiome - data analysis and interpretation.
		Exam 3, March 25, 2 PM to March 27, 11:59 PM
12	Mar 30 - Apr 3	Culturing and sequencing organisms of interest from the microbiome and its value.
13	Apr 6 - 10	Microbiome experiment - writing the report
		Review article by graduate students due April 10 at 5 PM
14	Apr 13 - 17	Microbiome experiment - writing the report
15	April 27	Project report due 5 PM

Content for the 6670C-level course:
In addition to all of the quizzes and exams taken by the undergraduates, graduate students will be asked to read and review recently-published papers from the current microbiome

literature where connections between the microbiome and a human disease have been reported. A review on what they have read will be due April 10 at 5 PM. To ensure the graduate students get started early on this review, they will be asked for the list of references on February 10 at 5 PM. An outline of the review will be due March 16 at 5 PM. Each graduate student writes his or her own review. There will be no working in groups on this. All assignments for the review MUST be entered into Canvas.

For the formatting of the reviews, we will use the instructions from Trends in Microbiology: http://www.cell.com/trends/microbiology/authors. Each review must follow that format precisely - up to 3500 words and 100 references in length. The abstract must be between 100 and 120 words. Clarity and conciseness of language will be important for each review. the objective of a scientific review is not just to inform the reader of the state of knowledge in a given area but also to inspire the reader to consider future experiments that can advance the field.

Grading Scale:

	Percentage
A	90 or above
A-	87-89
B+	84-86
B	80-83
B-	77-79
C+	74-76
C	70-73
C-	67-69
D+	64-66
D	60-63
D-	57-59
E	56 or below

For more information on grade points and UF grading policies, see
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Assessments

Exams: Three proctored exams will be administered during the semester. Each exam is worth 20% of your grade. Specific details regarding the exams and proctoring will be given closer to the exam dates.

Tentative exam date/times:

Exam 1	Wednesday, January 29	begins 2 PM, ends January 31, 11:59 PM
Exam 2	Wednesday, February 26	begins 2 PM, ends February 28, 11:59 PM
Exam 3	Wednesday, March 25	begins 2 PM, ends March 27, 11:59 PM
Project report	Monday, April 27	submitted by 5 PM

Extra assignment for graduate students:
Review article due Friday, April 10, 5 PM

Exam proctoring: Exams 1, 2, and 3 will be proctored using a proctoring service called ProctorTrack. Each student will be required to have an external camera for this purpose which will be used instead of your computers built in camera on your monitor or laptop. The cost is low (<$50) and it can likely be used in other courses offered by the Microbiology and Cell Science Department. Some of you may already have such a camera as it was used in four of our courses last semester. More details on proctoring and the external camera will follow soon.

Quizzes: Brief quizzes will be given that cover every two weeks of material. All quizzes are open book and unproctored. These short quizzes will be open at 2 PM on Fridays (see dates below) and need to be completed **Sunday evening BY midnight** every other week (excluding spring break). Following the lectures and taking these quizzes ensures timely participation and progress in the course. These quizzes are a *learning tool* so you may take each quiz up to **three times each** and only your last score of each week's quiz attempt will be recorded. Your quiz average will count for **20%** of your final grade. There will be a total of 6 quizzes (one for every two weeks of course material). You can drop your two lowest quiz scores. Your dropped quiz grades will include any quiz you miss for **any** reason. This includes minor illness, travel, meetings, and **technical problems** etc. Rarely, technical issues may occur while you are taking the timed quiz, and any quizzes affected by technical problems will count against your drops. A quiz will not be re-opened or reset if it is interrupted by technical difficulties. (NOTE: A slow Internet connection may affect timed quizzes, but it is your responsibility to use a connection at the speed suggested in the e-learning homepage.)

Plan to take each quiz and save up your dropped quizzes for unexpected events like illness or technical problems. Only quizzes that have been submitted by students can be accessed for studying for exams. Therefore, even if you choose to use a week as a drop and do not study, try to take the quiz anyway by the deadline so you can still access the quiz questions at later date. If you do not take a quiz during the open quiz window, then you are shut out of the quiz, and it cannot be reopened for you.

Following the close of each quiz and exam window, you have 10 calendar days to contest your quiz/exam grade in an email to me (i.e., a student cannot request a grade correction on quiz 2 during the last week of the course). Please note that you can ask a question about or discuss any quiz/exam question at any time during the semester for the purposes of understanding and education. Any requests for points must include a clear justification of your response. For example, please do not send an email saying "tell me why I am wrong", but rather send an email saying, "this is why I think my response is a better answer or is as complete or appropriate…."

Quiz times and dates:

Quiz 1	January 17	quiz window begins 2 PM, ends at 11:59 PM, January 19
Quiz 2	January 31	quiz window begins 2 PM, ends at 11:59 PM, February 2
Quiz 3	February 14	quiz window begins 2 PM, ends at 11:59 PM, February 16

Quiz 4	February 28	quiz window begins 2 PM, ends at 11:59 PM, March 1
Quiz 5	March 20	quiz window begins 2 PM, ends at 11:59 PM, March 22
Quiz 6	April 3	quiz window begins 2 PM, ends at 11:59 PM, April 5

Undergraduate (MCB 4320C) Assessment Breakdown

Exam 1	20%
Exam 2	20%
Exam 3	20%
Exam 4	20%
Quizzes (average of 5 highest scores)	20%
Total	100%

Graduate (MCB 6670C) Assessment Breakdown

Exam 1	15%
Exam 2	15%
Exam 3	15%
Project report	15%
Quizzes (average of 5 highest scores)	20%
Review article	20%
Total	100%

Make up and attendance policy: This is an online course that gives students enormous scheduling flexibility. Every assignment will be given at least double the adequate time needed to complete the assessment based on past experiences. Hence, accommodations for up to double the time needed to take an exam are already included in the assessment periods. As a result, there will be no makeup exams or quizzes for reasons not accepted by the University. An illness documented by a physician (not a physician's assistant) is grounds for a makeup exam. Otherwise, the deadlines are real and strict. As a student, it is your choice to take all quizzes and exams. If you choose not take a quiz or exam because of another activity (work, social engagement, etc), you will get a zero for the grade. There should be no conflict between the exams of this course and exams in any other course, because a 48-hour time frame provided during which you can take the exam. In the very rare cases where makeup exams or quizzes are offered, the composition and structure of the makeup assignment or exam will be similar to the standard exam or quiz.

Excused absences are consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.

Textbook: There is no required or recommended textbook.

Course structure: The course is structured as 14 Lessons – one each week of the semester. Each week will cover a different topic. The topics build on each other so in order to understand a topic in week 6, for example, it is necessary that you understand the material from week 1. The first 4 weeks of the course lay the foundation for the remaining weeks.

Each week begins on Monday morning, which is the day by which a new week's worth of material will be posted. Every effort on my part will be made to post material prior to Mondays, but that may not always happen. Start by navigating to the Lessons page. Then, click on the appropriate week. For each week's lesson, there will be several items to complete. Click on the link for each item. The first item will be the **learning objectives** for the week. Keep the learning objectives in mind as you learn the week's material. If you meet the learning objectives, you should do very well on the quiz and the exams. After reading the learning objectives, please go through the week's material in the order presented. The next item in the list will usually be the reading assignment (a handout) followed by the lectures, and links to any online tutorials or modules. After you go through the material in the order presented, you are always free to return and visit any of the content. The introductory lecture will give an example of the types of course content and how it will be presented. The pdf of the lecture slides will also be posted each week for your convenience. This convenience is for students who wish to print out the slides and follow along with the lecture, study the notes later, etc. The lectures slides will only be available in pdf format.

Each quiz will be based on the content of two weeks of material. The last attempt for each quiz will count toward your grade. If you only attempt a quiz once before 11:59 PM on Saturday, that score is the one that will count for that week's quiz grade.

Academic Honesty: As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dsoufl.ed/SCCR/honorcodes/honorcode.php.

Additional comments regarding academic integrity:
Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

- Have another person complete a quiz in this course
- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

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.

Campus Helping Resources: Students experiencing crisis or personal problems that interfere with their general well being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,* **www.counseling.ufl.edu/cwc/**
  - Counseling Services
  - Groups and Workshops
  - Outreach and Consultation
  - Self-Help Library
  - Training Programs
  - Community Provider Database
- *U Matter, We Care:* If you or a friend is in distaress, please contact umatter@ufl.edu or 352-392-1575 so that a team member can reach out to the student.
- *Career Resource Center,* First Floor JWRU, 392-1601, **www.crc.ufl.edu/**

Students Requiring Acommodations: Students requesting class accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide

documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

All exams and quizzes in this course will be given double the amount of time they typically require. As a result, a double-time exam/quiz length is already in agreement with accommodations that require this amount (or less) of extended time.

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. 0001 Reid Hall, 352-392-8565, **www.dso.ufl.edu/drc/**

Statement on Distance Education Courses
Should you have any complaints with your experience in this course, please visit http://www.distance.ufl.edu/student-complaints.

Course Evaluation
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Syllabus for MCB6937

Applied artificial intelligence in Biological Sciences

Fall 2020, 3 credits

INSTRUCTOR: Dr. Leandro Balzano-Nogueira

Email: leobalzano@ufl.edu

Office hours: Tuesday and Thursdays 3:00-5:00 pm. (check instructor availability on Canvas calendar)

Office location: Genetics Institute 351b

Course location: ON-LINE

DESCRIPTION. Introductory course to understand some concepts of Artificial Intelligence, and the applications of these methods over Biological sciences. This course has been designed to put the emphasis in **Biology**, which means that the idea is to learn the concepts of some artificial intelligence strategies, why it has been used for a particular problem, and what is the answer that the researcher would obtain after using a particular strategy. Students will learn how to code in R, build R scripts, identifying the problem to tackle, and use the adequate statistical tools to address this problem. Once done, the students will learn strategies to test hypotheses through "making the computer to think about the problem and solve it".

COMMUNICATION WITH INSTRUCTOR: Students can either formulate questions via CANVAS email, personally at office hours, or via Skype. Skype discussion sessions will be organized upon request and arranged within 3 days of request, when possible. Students who cannot attend regular office hours may contact the instructor for an alternative appointment.

PREREQUISITES: Students should have background knowledge in biology and genetics. Students are expected to be familiar with the principles of gene expression and the basic structures of the cell. Courses that meet these criteria are: BSC2010, BSC2011, MCB3020, MCB3023, BCH4024, PCB4522 or CHM3218. This course will explain some basic concepts of biostatistics, so previous knowledge in basic statistics such as mean, standard deviation, probability, distribution, correlation, among others could be useful, although this is not a mandatory requisite. Courses that meet these criteria are: STA2023**,** STA6166 or STA6167.

MOTIVATION FOR THE COURSE: Nowadays artificial intelligence is still a field that provokes curiosity but also fears, particularly in Biologists and similar-fields scientists that believe that these strategies are too abstract to be applicable in Biology, without noticing that these strategies are mainly based on various basic principles of statistics and iterative processes. This course was designed to decode the mystery behind artificial intelligence, showing the way of thinking required to develop a question and determine the adequate AI-tool/strategy to answer that particular question. In order to be able to select the strategy, certain statistical parameters have to be considered, but the course is designed from a biological point of view, so the students of this -and similar- field, could understand the idea behind the strategies putting aside the hardcore mathematics or the computational concepts. Also, students with computational backgrounds could find this course interesting since, it could provide them the biological standpoint necessary to solve a problem. This introductory course in artificial intelligence intends to shorten the distances between those three worlds, Biology, informatics, and statistics, teaching students

to “speak” those three languages and serving as bridges to perform better studies, according to the multidisciplinary context in which we are living. In order to be able to do this, the students will be trained in one of the most important data analysis and statistical platforms, will know about statistical strategies related to some artificial intelligence approaches, being capable of identifying the best approach to solve a particular biological problem, will be able to understand and interpret the obtained results, and will prepare them for more advanced courses in any of the three mentioned worlds.

COURSE CONTENT: This is a 3 credits course that introduces students to the basics of R as a platform for artificial intelligence. It teaches the most important statistical concepts and algorithms used in data analysis and teaches the way to analyze, understand and apply the correct AI tool depending on the question to be answered. Most of the course will be dealing with R platform.

The course is provided as a graduate (6000) level class. The course will be entirely web-based, and all lectures will be delivered on-line. The course lecture materials, on-line activities and assignments will be posted on a weekly basis with new content being available on Mondays. While new material will be added at the beginning of week, past materials will be maintained on-line for students to review if necessary.

COURSE OBJECTIVES:

By the end of the course, the student should be able to:

1. Write basic R scripts to analyze Biological datasets
2. Understand basic and intermediate principles of biostatistics, always data-driven.
3. Understand some concepts of artificial intelligence, understanding some strategies and “how” and “when” to use them.
4. Understand the basics of supervised and probabilistic learning strategies, unsupervised methods, evaluate the performance of the applied method and learn techniques to improve model performance from a biological standpoint.

COURSE SCHEDULE:

Week starts	Topic	Description
8/31/2020	Introduction to Artificial intelligence	What Is artificial intelligence?, the Foundations of Artificial Intelligence, The History of Artificial Intelligence, The State of the Art of Artificial Intelligence
8/31/2020	R platform as an instrument to perform Artificial intelligence data analyses	The R language and RStudio, Installation of the packages, Help in R Language elements: vectors, matrices, lists, functions, data frames, factors. The "as." Function. Language elements: brackets, curly brackets, arrow, colon and semi-colon, comments.
9/8/2020	Basic understanding of R	Assign value to a variable, browse data, Basic operators, Logic operators, Read and Write, Data generation
9/14/2020	Intermediate Functions in R	Basic statistics (mean, median, mode, etc), Compare sets, Order, string manipulations, Matrix, Subsetting, Transformation of data, normalization
9/21/2020	Conditional statements in R as first Artificial Intelligence function. Descriptive Statistics I. Tables and graphs	Apply family, Loops, Creating functions, R markdown. What is statistics?, measures of central tendency, analysis between quantitative variables, (Pearson Correlation, Spearman correlation).
9/28/2020	Descriptive Statistics II. Tables and graphs	Analysis between qualitative variables (chi square test, Fisher exact test, Kolmogorov–Smirnov test) Analysis between a qualitative and a quantitative analysis (student T test, Mann-Whitney U, Wilcoxon test)
10/5/2020	Multivariate statistics	Clustering of gene profiles, Heatmaps, PCA, Multiple testing, Bootstrap
10/12/2020	Forms of learning I	Supervised learning, lazy Learning, Nearest neighbor (k-NN) classification, Example applied in biological data
10/19/2020	Forms of learning II **Project 1 due date**	Learning decision trees, random forest, applications in Biology
10/26/2020	Probabilistic learning	Classification using Naïve Bayes, Example in biological data
11/02/2020	Probabilistic learning over time	Inference in temporal models, Hidden Markov Models (HMM) applied in Biology

11/09/2020	Black-box methods	Artificial neural networks (ANNs), Support vector machines, Biological example
11/16/2020	Learning with Hidden Variables	The Expectation-Maximization (EM) Algorithm, Example in biological data
11/23/2020	Finding groups of Data	Clustering, K-means, Example in biological data
11/30/2020	Evaluation of the performance of the models	Sensitivity, specificity, positive-predictive value, negative-predictive value, F-measures, ROC curves
12/07/2020	Improving model performance	Meta-learning, bagging, boosting, Random forests Example in Biological data
12/14/2020	**Project 2 due date**	

SOFTWARE: Students will need to install the following free softwares: R (http://www.r-project.org) and RStudio (http://www.rstudio.com/). How to install these programs will be explained in the initial lecture. How to install R-packages will also be explained during the lectures when required.

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. Such violations are also against university policies and rules, disciplinary action will be taken as appropriate. If you need assistance with technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

RECOMMENDED BOOKS AND PAPERS: The course does not require a textbook. Recommended books and readings include:

- *R Programming for Bioinformatics*. Robert Gentelman. July 14, 2008 by Chapman and Hall/CRC. ISBN 9781420063677
- Sonia Tarazona, Leandro Balzano-Nogueira, David Gómez-Cabrero, Andreas Schmidt, Axel Imhof, Thomas Hankemeier, Jesper Tegnér, Johan A. Westerhuis, Ana Conesa. (2020). Harmonization of quality metrics and power calculation in multi-omic studies. Nature Communications. 11:3092. https://doi.org/10.1038/s41467-020-16937-8
- *Artificial Intelligence: A Modern Approach* (4th Edition). Stuart Russell and Peter Norvig. (2020). Prentice-Hall. ISBN 0-13-461099-7

COURSE STRUCTURE AND EVALUATION:
Lectures and exercises will be posted weekly. Quizzes will be used for students to monitor their progress. Students must complete exercises assigned each week by the Monday of the next week 12am, unless otherwise stated. Two projects will evaluate the progress of the students, both projects will be about analyzing a particular dataset. The students will have to create an R markdown script-report explaining the decisions that the student took to analyze that particular dataset, explaining the obtained results and discussing from a biological standpoint those results. Students will be given between 2 and 3 weeks to complete each project.

Weekly exercises (assignments and quizzes): 600 points

Projects: 400 points, 200 points each

Instructor might introduce additional quizzes and assignments during the course to accommodate the progress of the class. Therefore, the total final number of points might vary. Grades will be computed as percentages over the total number of points at the end of the semester (see below).

A final grade will be determined by the summation of points obtained each week. Projects I and II are worth 200 points respectively. Extra points can be earned by including essays for additional specific subjects of the course.

Project 1: Students will receive a dataset and several questions, then they will have to create scripts and functions in R to answer those questions applying the correct statistical methods and AI approaches. A well-described R markdown report will have to be created, describing adequately the data, followed by a discussion of the AI approach chosen to analyze that data explaining why that method and no other is more suitable in that particular case. Also, they will have to explain the meaning of their results, discussing and concluding about the biological findings. They will have to provide, not only the R markdown script but also the final pdf report generated by the mentioned script. Points: 200.

Project 2: Students will receive a dataset, a description of a previous AI analysis performed on that dataset, and the conclusions that the previous work achieved. Then, they will have to put into practice all the acquired knowledge to identify the mistakes performed in the previous work, judging if the biological conclusions of that previous work are correct or not, and propose a different AI approach. After applying their own AI approach, they will have to evaluate if its performance is better than the previous one, and they will have to conclude from a biological perspective their own results. In this case, a well-described R script will be evaluated, as well as a word report explaining the data, followed by a discussion about the analysis done by the previous researcher(s), why the student decided to perform a new set of analyses and the conclusions of the analysis in terms of performance of their own -student- approach versus previous approach and the biological conclusions that can be achieved now. Points: 200.

GRADING POLICIES:

Grading Scale Numerical Equivalents	
A = 90% points or above	C = 69%-71.9%
A- = 86%-89.9%	C- = 66%-68.9%
B+= 83%-85.9%	D+= 63%-65.9%
B = 79%-82.9%	D = 60%-62.9%
B- = 75%-78.9%	D- = 57%-59.9%
C+= 72%-74.9%	E = 56% or below

Information on current UF grading policies for assigning grade points can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

ATTENDANCE AND MAKE-UP WORK: This is an on-line course, therefore no attendance requirements are applicable. **Students are expected to follow on-line material posted on a weekly basis and submit weekly assignments on time**. There is no specific make-up work. Students can recover points by completing exercises where extra points are possible. Assignments and quizzes are strictly due

on the indicated due time and day. **Students are strongly encouraged to submit their work via Canvas time ahead the due time to accommodate possible internet delays**. Work completed within due date but submitted after due date is always considered late submission, with no exceptions. Late submissions will have a penalization of 10% each day for 3 days. After 3 late days, the grade is zero. Students may be granted with a late submission penalization waiver **only ONCE** during the course period. Still, work must be returned within the 3 days after submission deadline, and after 3 late days, grade will be zero. This strict late policy is required as corrections to exercises may be communicated 3 days after submission deadline.
In case a student has used his/her one-time late submission penalization waiver and undergoes extenuating circumstances leading to late work, a **written proof** of these circumstances should be included in any communication with the instructor requesting extension of submission deadline. Requests without a written proof will not be considered. The instructor may or may not grant additional accommodations for this late work.
Prerequisite information and credit suitability can be found in the course catalog. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies and can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

NETIQUETTE GUIDE FOR ONLINE COURSES: It is important to recognize that the on-line classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for on-line behavior and interaction are known as netiquette. More information on netiquette for on-line courses can be found here:
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

ACADEMIC HONESTY: Remember that you committed yourself to academic honesty when you registered at the University of Florida. All students are bound to:

The Honor Pledge
We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty 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."

Academic Honesty Guidelines: "All students are required to abide by the Academic Honesty Guidelines which have been accepted by the University. The academic community of students and faculty at the University of Florida strives to develop, sustain and protect an environment of honesty, trust, and respect. Students are expected to pursue knowledge with integrity. Exhibiting honesty in academic pursuits and reporting violations of the Academic Honesty Guidelines will encourage others to act with integrity. Violations of the Academic Honesty Guidelines shall result in judicial action and a student being subject to the sanctions in paragraph XIV of the Student Code of Conduct."
The Honor Code (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx) specifies a number of behaviors that are in violation of this code and the possible sanctions.

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not

be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code. If you are aware of a climate that promotes academic dishonesty, please notify the instructor, the Student Honor Court (392-1631) or the Cheating Hotline (392-6999).

SOFTWARE USE: Students will need to install two free softwares (R and RStudio). 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. Such violations are against university policies and disciplinary action will be taken as appropriate.

CANVAS (http://elearning.ufl.edu): Here you will find the syllabus, gradebook, files, class announcements, and other pertinent info for the course. It is your responsibility to check Canvas often to make sure that you do not miss important announcements and to ensure that your grade book is accurate. For computer assistance, visit http://helpdesk.ufl.edu/.

STUDENTS WITH DISABILITIES: The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students with disabilities requesting accommodations should first register with the Disability Resource Center (0001 Reid Hall, 352-392-8565, http://www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible.

CAMPUS RESOURCES: Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance. University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu/cwc/

1. Counseling Services: University Counseling Center, 301 Peabody Hall, 392-1575
2. Personal and career counseling: Student Mental Health, Student Health Care Center, 392-1171
3. Sexual counseling: Sexual Assault Recovery Services (SARA), Student Health Care Center, 392-1161
4. Career development assistance and counseling: Career Resource Center, First Floor Reitz Union, 392-1601, www.crc.ufl.edu/

For **emergencies** call the University of Florida Police Department: 392-1111 or 911.

U MATTER, WE CARE: Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency,

call 9-1-1. U Matter We Care, www.umatter.ufl.edu/

EVALUATIONS: Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted on-line at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results. Each on-line distance-learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See http://distance.ufl.edu/student-complaints for more details

DISCLAIMER: This syllabus represents my current plans and objectives. If those need to change as the semester progresses, then the changes will be communicated to the class clearly.

Virology
MCB 5505

Course Description: This course is for graduate students and is designed to introduce you to the field of virology, teach you the components of viruses, their replication strategies and the human diseases caused by common and emerging pathogen. This course will also cover the importance of viruses in maintenance of human health (e.g. the virome, gut homeostasis and involvement in development of non-viral disorders) and how viruses can be manipulated by scientists for the treatment of disease.

Learning Objectives and Outcomes: Upon completion of this course you should have a solid knowledge of the basic characteristics of viruses and know the mechanisms of infection and replication for each type of viral genome. You should also be able to name pathogens belonging to each viral genome category and be able to describe the disease, infection and transmission characteristics of these pathogens.

Instructor: Dr. Melissa Jones,
Assistant Professor,
Microbiology and Cell Science
Office: MCSB 1148
Lab: MCSB 1160
Phone: 352-392-5923
Email: through Canvas

Office Hours: Office hours are available by appointment only. When emailing to request an appointment, provide **three** potential days/times for the meeting and Dr. Jones will select one. Meetings can be held in person or via phone or Skype.

Communication: Questions should be submitted to TAs or the FAQ board of the Canvas page referenced prior to emailing Dr. Jones with a question. Dr. Jones typically responds to email within 48hrs.

Prerequisites: Microbiology, Genetics, Biochemistry or Molecular Biology course

Teaching Assistants: Names and email addresses can be found on the course Canvas page.

Required Textbook: Principles of Virology: Volume I, 4th edition

Students are allowed to use previous editions of the required text. However, it is the student's responsibility to find the corresponding text sections in older editions. Chapter and page designations will only be provided for the edition noted above. If you are interested in a thorough accessory textbook, Fields Virology is a wonderful resource. Fields Virology is NOT required. Print versions are quite expensive, but this text is available through the UF library online system. More details about the system are listed below and can be found on the course website.

Canvas General Discussion Board: One of the most useful Canvas tools for communicating information is the discussion board. Dr. Jones will post commonly asked questions (and their answers). If you have general questions about the lab or a lab exercise, it is very likely that another student has the same question. Please post these questions on the discussion board. Postings and answers are monitored by the instructor and TAs to make sure no mistakes are propagated.

Course Structure:
As an online course, there will be a collection of modules which contain lectures, videos, podcasts and written materials to be viewed by the student to facilitate learning of basic principles of virology. Students will be assessed through weekly quizzes, assignments, discussion board posts and examinations. All quizzes, assignments and discussion posts are designed to serve as a review of key material and focus your study for the larger examinations.

Grading: For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx. Below is the breakdown for how the different course components are weighted. Beneath the tables are explanations about each component.

MCB 5505 (graduate level)	
Quizzes	5%
Exams (3)	60 %
Class Assignments (x3, 5% each)	15 %
Discussion Posts	5 %
Graduate Writing Assignment	15 %

Grading Scale: The cutoffs for letter grades will be as follows

Grading Scale			
	Percentage		Percentage
A	93.0 - 100%	C	72.0 - 75.99%
A-	89.0 - 92.99%	C-	69.0 - 71.99%
B+	86.0 - 88.99%	D+	66.0 - 68.99%
B	82.0 - 85.99%	D	62.0 - 65.99%
B-	79.0 - 81.99%	D-	59.0 - 61.99%
C+	76.0 - 78.99%	E	58.99% and below

**Grade rounding will be done as outlined above.
**Canvas does not always calculate grades correctly. It is recommended that you calculate your own percentage to be sure you know your accurate grade.

Syllabus Quiz: Important information about the course is found in the syllabus and it is required that each student read the syllabus to find answers to commonly asked questions and information about various aspects of the class. Therefore a **mandatory syllabus quiz** must be taken and passed with an 80% before access to the first module will be granted.

Quizzes: There will be a short quiz assigned each week, 10 days given to complete them. Any quizzes submitted after the posted due date will have points deducted from the final score for being late. Quizzes are due by 11:59pm EST of the assigned due date and the quizzes must be completed by that time. Please allow adequate time to take the quiz before 11:59 pm EST. Be aware that if a quiz is started before 11:59pm EST but not completed until after that time, it WILL be marked late. For each day the quiz is late, 10% will be deducted from the total score. Quizzes are open book and open note and should be viewed as an opportunity to review the material and focus your study for the larger examinations.

Quiz questions will not be used on the exams, but the same material will be covered.

Examinations: There will be three mandatory exams in this course. There will also be a cumulative final given during exam week. The final is optional and the score from the final may be used to replace a lower grade from one of the previous exams. If all fours exams are taken by the student, the highest three scores will be used to calculate the final grade. Therefore, if you do poorly on an exam during the semester, you can improve your grade by doing better on the final exam. Exams will be open for a 72-hour window and must be taken within that time period. Make-up of missed exams will follow UF policy. Further information regarding make-up exams, assignments and other work can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Exam Policy: All exams are proctored online by ProctorU. Instructions for scheduling your proctored exam may be found on the homepage of the course and are also provided on the Canvas Orientation Modules. Any questions or issues concerning online proctoring should be directed to ProctorU and not to the instructor. In addition, each student is responsible for scheduling their exams during the 72 hour exam window. It is strongly suggested that students sign up for exam times well in advance as times fill up quickly.

Class Assignments: At the beginning of the semester each student will choose one pathogenic virus that they will use to complete specific assignments over the course of the semester. It is suggested that students pick well characterized or heavily studied viruses as this will make the task of finding information about them significantly easier. These assignments are individual projects used to expand your knowledge base of a particular virus. Upon completion of an assignment, students will uploaded documents to Canvas. These are NOT group assignments and students are expected to write their reports individually. The Turn-It-In feature on Canvas automatically compares all assignment submissions and checks for plagiarism of both published material and submitted assignments. Plagiarism of outside material or other students is not tolerated.

Graduate writing assignments: Throughout the semester graduate students will be assigned peer-reviewed papers to read and analyze as well as provided with guidelines for how analysis of the papers should be completed. During the semester, student will submit, 1-2 page reports on the topics covered and reports will be submitted through Canvas.

Discussion Board Posts: All students are expected to participate in their groups discussion board assignments. Posts are graded on a pass/fail basis and should be a minimum of 5 sentences. A 5-10 sentence response is typical. Each student must post in the discussion before they will be allowed to see responses from other students. "Ghost posts" (i.e. posting one word or a period so other student responses can be viewed) will receive an automatic failing grade. Specifics about the parameters for responses will be provided with each assignment prior to the opening of the post.

Student Groups: Given the large size of this course (600+ students), the class will be divided into groups of approximately 10 students, and these student groups will be assigned to a specific TA. The purpose of these groups is to aid in timely answering of questions regarding assignments and course content. For questions regarding the course material, please contact your TA for clarification or explanation. If you question cannot be answered, then the TA will forward it to the instructor. TAs can also clarify due dates or assignment descriptions. TAs can NOT grant deadline extensions or alter grades. These requests must be placed to the instructor direction.

In addition, student groups will also be used for Discussion Post assignments. Keep in mind that these are NOT group assignments, but rather a way of better facilitating discussion through the use of smaller groups. These groups will remain the same throughout the semester.

Readings: Each week "required" and "suggested" portions of the textbook will be assigned. Required readings will be portions of the textbook that are important for you to know, but are not thoroughly covered in lectures. Exam questions will be taken from these sections. Suggested readings will reiterate what is covered in lectures and are provided to help further your understanding of the material covered.

Extra Credit Assignments: There will be no extra credit assignments given in this course.

Due Dates: All assignments are due by 11:59 pm EST on the specified due date. Any assignment submitted after 11:59 pm EST on the due date will be marked as late, even if the assignment was started (e.g. a quiz) prior to the final submission time. Canvas documents submission times based on the time zone in which the University resides and time stamps assignment submission accordingly. Therefore, students who reside outside EST will need to ensure their assignments are submitted by 11:59 pm EST and **NOT** their local time. **For each day an assignment or quiz is late, 10% will be deducted from the total score**.

Attendance Policy and Make-ups: Make-up of missed work will follow UF policy. Further information regarding class attendance and make-up exams, assignments and other work can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Online Course Evaluation Process: Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.

Academic Honesty: As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/studentconduct-honor-code.

The Honor Code: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the university, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior. Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court. (Source: 2007-2008 Undergraduate Catalog).

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor. This policy will be vigorously upheld at all times in this course.

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 require for each student to have MS Office (Mac or PC) installed on their/a computers. Similar graphing programs are available for iPads and tablets.

Microsoft Software for UF students:

http://www.software.ufl.edu/

The Office of Information Technology has great news for University of Florida students! If you want to upgrade your operating system or need Microsoft Office Suite, this media will be available in the Spring 2011 semester. The different media available are: Windows 7 operating system Upgrade, Microsoft Office Professional Plus 2010 (32-bit/64-bit) for PC or Microsoft Office for Mac 2011. Software is free for UF students. To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392- HELP(4357). Once the media is available, you can get it at the UF Computing Help Desk or at the UF Bookstore. Other software training opportunities are available. For examples through Lynda.com http://www.lynda.com/member.aspx

Campus Helping Resources: Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university's counseling resources. Both the Counseling Center and Student Mental Health Services provide confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health Services is located on the second floor of the Student Health Care Center in the Infirmary.

- University Counseling Center, 301 Peabody Hall, 392-1575, www.counsel.ufl.edu
- Career Resource Center, CR-100 JWRU, 392-1602, www.crc.ufl.edu/
- Student Mental Health Services, Rm. 245 Student Health Care Center, 392-1171, www.shcc.ufl.edu/smhs/

Alcohol and Substance Abuse Program (ASAP)
Center for Sexual Assault / Abuse Recovery & Education (CARE)
Eating Disorders Program
Employee Assistance Program
Suicide Prevention Program

Students with Disabilities: The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. 0001 Reid Hall, 392-8565, www.dso.ufl.edu/drc/

Library access: The university library has access to the majority of medical and scientific journals as well as a variety of virology and microbiology textbooks in electronic format. UF students can access these resources through the UF UF libraries website: http://library.health.ufl.edu. However, the student must be on the UF network (on campus or through the UF VPN remotely) to do this. Instructions for accessing the UF VPN will be provided on the course canvas page.

Course Overview

Week - Date	Topic	Assignments
Week 1 January 6	Virology basics: ● What are viruses ● History of virus discovery ● Virus classification ● Overview of viral replication	Syllabus and Course Intro Quiz (not graded) - course content will not open until this is taken and passed (80% or better) Week 1 Quiz **assigned**
Week 2 January 13	Overview of Viral replication: ● The Baltimore Scheme ● General Replication Strategies of Viral genomes ● Mechanisms of Viral Evolution	Week 1 Quiz **due** Week 2 Quiz **assigned** Class Assignment #1 **assigned**
Week 3 January 20	Mechanisms of Viral Attachment and Entry ● Binding to host receptors ● Mechanisms of receptor mediated endocytosis ● Mechanisms of membrane fusion	Week 2 Quiz **due** Week 3 Quiz **assigned** Graduate Student Assignment #1 **assigned**
Week 4 January 27	SS (+) RNA viruses: ● The infectious cycle and replication strategies of Picorna and Alphaviruses ● Epidemiology and Disease of: • Norovirus • Zika • Coronavirus • Dengue and ADE	Class Assignment #1 **due** Week 4 Quiz **assigned** Discussion Board #1 **assigned**
Week 5 February 3	Retroviruses and integration: ● The infectious cycle and replication strategies of HIV and other Lentiviruses ● Epidemiology and Disease of: HIV	Week 4 Quiz **due** Week 5 Quiz **assigned** Class Assignment #2 **assigned** Exam 1 review: Feb 6
Week 6 February 10	SS (-) RNA viruses: ● The infectious cycle and replication strategies of Vesicular Stomatitis Virus and Influenza ● Epidemiology and Disease of: ○ Influenza ○ Rabies ○ Mumps ○ Ebola	**EXAM #1 window** Week 5 Quiz **due** Discussion Board #1 **due** Week 6 Quiz **assigned** Graduate Student Assignment #2 **assigned**

Week 7 February 17	dsRNA viruses and ssDNA viruses: ● The infectious cycle and replication strategies of Reo and Parvoviruses ● Epidemiology and Disease of: Rotavirus	Week 6 Quiz **due** Graduate Student Assignment #2 **due** Week 7 Quiz
Week 8 February 24	Reverse Transcriptase DNA viruses and dsDNA viruses: ● The infectious cycle and replication strategies of Hepatitis B, Herpes and Pox viruses ● Epidemiology and Disease of: Hepatitis B	Week 7 Quiz **due** Class Assignment #2 **due** Week 8 Quiz **assigned** Graduate Student Assignment #3 **assigned**
Week 9 March 2	Spring Break	Spring Break
Week 10 March 9	dsDNA viruses: ● Persistent Viral Infection ● Epidemiology and Disease of: ○ Herpes Simplex Viruses ○ Epstein Barr Virus ○ Varicella Zoster Virus	Week 8 Quiz **due** Graduate Student Assignment #3 **due** Week 10 Quiz **assigned** Class Assignment #3 **assigned** Exam 2 Review
Week 11 March 16	Vaccines and antiviral medications: ● Types and uses of viral vaccines ● Antiviral drugs ● Epidemiology and Disease of: Hepatitis C	**EXAM #2 window** Week 10 Quiz **due** Week 11 Quiz **assigned**
Week 12 March 23	Bacteriophage and The Virome ● Bacteriophage structure and replication ● Phage Therapy ● The virome and host health	Week 11 Quiz **due** Week 12 Quiz **assigned**
Week 13 March 30	Oncogenic viruses ● Cellular transformation and cancer formation ● Epidemiology and Disease of: Human papillomavirus	Week 12 Quiz **due** Week 13 Quiz **assigned**

Week 14 April 6	The role of viruses in non-viral disorders ● Type I diabetes ● Crohn's Disease ● Celiac Disease ● Ulcerative Colitis	Graduate Student Assignment #3 **due** Week 13 Quiz **due** Week 14 Quiz **assigned** Discussion Post #2 **assigned**
Week 15 April 13	Viral gene therapy and oncolytic viruses: ● Introduction to gene therapy ● Using viruses to treat cancer ● Adenoviruses and other viral vectors	Week 14 Quiz **due** Class Assignment #3 **due** Week 15 Quiz **assigned** Exam 3 review session
Week 16 April 20	Exam 3 and DP submission	**Exam #3 window** Week 15 Quiz **due** Discussion Post #2 **due**
Exam week April 27	Final Exam - optional	**Final Exam window**

MCB6424 Probiotics (3 credits)
Spring 2022

MCB6424 will cover the use of microorganisms to promote a health status in the animal and human host. This course will provide a conceptual background in microbiology and immunology for the use of microorganisms for the prevention or treatment of animal and human diseases.

Student Learning Outcomes – After successful completion of this course, students will be able to:

- Understand the history of probiotics
- Compare and contrast the use of lactic acid bacteria, *Bifidobacterium* and *Propionibacterium* as probiotics
- Understand the range of proposed probiotics and the challenges in ensuring their safety and efficacy
- Compare and contrast the mechanisms used by probiotic microorganisms to modulate the host immune responses in the animal and in the human host
- List the proposed uses of probiotic microorganisms for the prevention or treatment of animal and human diseases
- Compare and contrast the applications of prebiotics, probiotics and symbiotics
- Discuss current research efforts and proposed applications of probiotics for animal and human health

Lectures: Online through Canvas

Instructor: Dr. Graciela L Lorca

Office: Genetics Institute, Room 307

WebPage: Canvas (https://ufl.instructure.com/). Please select MCB6424

On line help with classroom technology: http://helpdesk.ufl.edu/

Pre-requisite: MCB3020 or MCB3023

Communication: for questions regarding class and textbook content use the Discussion Board, for issues on Home Work Assignments, class organization check first the syllabus, the announcements and calendar on Canvas, then post your questions on the discussion board. For all other issues contact Dr. Graciela Lorca.

VIRTUAL OFFICE HOURS: will be available every week through the ZOOM tool in Canvas. To participate go to ZOOM Conferences in the left of your screen and join! You will receive a weekly remainder by email.

If you cannot make it to office hours you can request an appointment. Send an e-mail with three suggested times and I will choose one for us to meet.

Contact Information: Use TEACHER in your emails through Canvas ONLY (personal emails should only be used in a case of emergency)

Dr. Graciela L Lorca:

Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use glorca@ufl.edu)

Phone: 273 8090 (please leave a message).

Office hours: Fridays 2-3 PM through ZOOM Conferences. By appointment: (only if you cannot make it to office hours) send an e-mail with three suggested times and I will choose one for us to meet.

- **Discussion Board:** A discussion board is available in Canvas. It is very useful, please post and answer your questions on class content and organization there. Postings and answers are monitored by the instructor to make sure no mistakes get propagated. There are several discussion themes. Please post your questions in the adequate section.

Material

- **Textbook:** textbook is not required; this course is based on peer reviewed papers either available for free through the links provided or through the UF library (ejournals).

- **Suggested readings**: For each module, suggested readings will be posted as pdf documents on Canvas or as links to download them from PUBMED (see working list at the end of the document). Remember to connect to UF through VPN (if outside campus) before accessing the journals (https://connect.ufl.edu/it/wiki/pages/glvpn.aspx).

Assessment of learning

Activities (250 points): Activities will be assigned by Unit.

- **Assignments 1 to 4 (40 points each)**. These assignments include online research on diverse topics such us “Introducing my favorite putative probiotic microorganism”, “Cell wall homeostasis in LAB”, “Microbiome based therapeutics”, and “Market claims: is there scientific evidence?”. These activities are mandatory and count towards the final grade. **They should be completed by the deadline indicated on Canvas.**

LATE SUBMISSION POLICY: a 5% deduction will be applied per day that the assignment is late.

- **Weekly activities "Main concepts that I should know" (9 points each).** The goal of these assignments is that the student keeps up with reading of the material on weekly basis. To achieve this goal, you are required to design questions that will assess the main concepts of this unit. The activities are mandatory and count towards the final grade. **They should be completed by the deadline indicated on Canvas.** **LATE SUBMISSION POLICY:** a 5% deduction will be applied per day that the assignment is late.

- **Topic review (300 points):** The research topics will involve the search and writing of a critical review of at least 5 scientific articles (original research, no reviews will be allowed). Other articles can be used to introduce the topic in the introduction section. The student will have to complete the review on one of the six topics that will be listed on Canvas (ONLY) as follows:
  - Probiotics and viral infections
  - Conflicts between study of probiotics as foods, dietary supplements and drugs in the US
  - Use of Omics technologies to help understand the microbiome and probiotic functionality
  - Improving probiotic specificity – 'designer probiotics'
  - Probiotics for animals – are they regulated?
  - Postbiotics

  LATE SUBMISSION POLICY: a 5% deduction will be applied per day that the assignment is late.

- **Exams (450 points):** Exams will assess your knowledge of the concepts covered during the lectures. Students must sign up on ProctorU at least 72h in advance. You will have to start the exam before 9 PM ET for test 1-3 and before 7 PM ET for test 4 (to allow time for system check up and completion of the test before it closes at 11 PM ET).
  The assessment will be performed in **Three Mandatory Mid-term exams.** The student will be given the option to take a final cumulative exam to improve the grade obtained through the mid-term exams.

  - *Mid-terms (450 points):* There will be three 50 minutes proctored mid-term exams (150 points each) with multiple choice questions, match and or true/false type of questions. **All exams are mandatory and will count towards the final grade.** Exams will test learning and understanding of material presented in lectures, assigned readings and in assignments.
  - *Optional Final to replace ONE test (Tests 1, 2 or 3) with the lowest grade (if a higher score in the final is achieved, if not, the score from the test will be used)*. It will be available during Finals Week. The students MUST have taken all three tests

to qualify for the Optional Final. This cumulative test will include all the content included in Units 1 to 5 and will be worth 150 points.

Make-Up policy: Make-up exams will ONLY be allowed with a VALID justification. If one exam is missed, it will result in a score of 0 for the test (see below for "Excused absences").

Excused absences:

Documentation MUST be provided for absences caused by serious illness, accident, jury duty, or death in the immediate family. You must contact the instructor **as soon as possible** of the missed exam and I will arrange an alternative time for the exam.

*After the exam***:** The grades will be available on Canvas three days after the exam, unless notified by an announcement. Test questions will be made available through personal meetings. After the scores release the student will have **two weeks** to submit questions about the test or claim mistakes in grading. No claims will be considered after that time.

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Grades and Grade Points

For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Grading: Straight scale

Grading Scale	
A	900 or above
A-	860-899
B+	830-859
B	790-829
B-	750-789
C+	720-749
C	690-719
C-	660-689
D+	630-659
D	600-629
D-	570-599
E	560 or below

Schedule of Classes

Date	Unit	Module. Topic
	Unit 1	**Probiotics: definitions, history and classification**
05-Jan*		1. Definitions and History
		2. Classification and physiology: Lactic acid bacteria (LAB)
		3. Classification and physiology: *Bifidobacterium* and *Propionibacterium*
		4. Impact of genomics on the characterization of probiotics_Intro to genomics
		4. Impact of genomics on the characterization of probiotics_LAB part 1
		4. Impact of genomics on the characterization of probiotics_LAB part 2
21-Jan		Assignment 1 due
	Unit 2	**Biotechnological applications of Lactic acid bacteria**
21-Jan*		5. The uses of LAB in food fermentation -part 1
		5. The uses of LAB in food fermentation -part 2
		6. Antimicrobials components of LAB
		7. Bacteriophages from LAB
		8. Nutraceutics and high value metabolites produced by LABs
04-Feb		Assignment 2 due
06-07 Feb		Test 1
	Unit 3	**Interactions of probiotics with the host immune system**
08-Feb*		9. Overview on the adaptive and innate immune response - Part 1
		9. Overview on the adaptive and innate immune response - Part 2
		10. Immunomodulatory properties of probiotics: bacterial surface proteins
		11. Immunomodulatory properties of probiotics: interactions with the immune system
		12. Engineering LAB and *Bifidobacterium* for mucosal delivery of heath-associated molecules: Genetic tools
		12. Engineering LAB and *Bifidobacterium* for mucosal delivery of heath-associated molecules
25-Feb		Assignment 3 due
	Unit 4	**Probiotics safety and efficacy**
26-Feb*		13. FAO/WHO Guidelines on Probiotics
		14. Safety considerations on probiotics
		15. Environmental factors influencing the efficacy of probiotics
		16. Efficacy of probiotics in Human Subjects: Part 1
		16. Efficacy of probiotics in Human Subjects: Part 2
		16. Efficacy of probiotics in Human Subjects: Part 3
		16. Efficacy of probiotics in Human Subjects: Probiotics by design
		17. Probiotics in Animal Production and Health
04-05 Mar		Test 2
	Unit 5	**New frontiers in the probiotic's field**
04-Mar*		18. Overview on the microbiome – Part 1
		18. Overview on the microbiome – Part 2
		19. Manipulation of the microbiome with probiotics

	20. Microbiome based new probiotic microorganisms 21. Fecal transplants as probiotics 22. Probiotics, prebiotics, symbiotic and postbiotics 23. Psychobiotics and the Manipulation of Bacteria–Gut–Brain Signals
25-Mar	Assignment 4 due
04-Apr	Topic review due
15-16 Apr	Test 3
24-25 Apr	Test 4 - Optional Final

***Release date for the Unit on Canvas**

University of Florida Policies

Grades and Grade Points

For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Attendance and Make-Up Work

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Services for Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center (https://disability.ufl.edu/get-started/). 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.

Campus Helping Resources

Health and Wellness

- U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website (https://umatter.ufl.edu/) to refer or report a concern and a team member will reach out to the student in distress.

- Counseling and Wellness Center: Visit the Counseling and Wellness Center website (https://counseling.ufl.edu/) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website (https://shcc.ufl.edu/).

- University Police Department: Visit UF Police Department website (https://police.ufl.edu/) or call 352-392-1111 (or 9-1-1 for emergencies).
  UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website (https://ufhealth.org/emergency-room-trauma-center).

- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website (https://gatorwell.ufsa.ufl.edu/) or call 352-273-4450.

Academic Resources

- E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services (https://career.ufl.edu/).
- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources (https://uflib.ufl.edu/).
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring (https://teachingcenter.ufl.edu/).
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers (https://writing.ufl.edu/writing-studio/).
- Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information (https://sccr.dso.ufl.edu/policies/student-honor-%20code-student-conduct-code/).
  On-Line Students Complaints: View the Distance Learning Student Complaint Process (https://distance.ufl.edu/state-authorization-status/#student-complaint).

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. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Class demeanor

Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Additional comments regarding academic integrity:

Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

- Have another person complete a quiz in this course
- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

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.

Microsoft Office 365 Software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

Most problems, questions and concerns about the course will be resolved by professionally communicating with the instructors.

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.
- Online Course: http://www.distance.ufl.edu/student-complaint-process.

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions maybe delayed.

If a student is lacking professionalism repeatedly, the instructor has the rights to file formal complaint against the student through the Dean of Student office.

Suggested Readings and Sources

Unit 1. Probiotics: definitions, history and classification

Module 1. Definitions and History

- Gogineni VK, Morrow LE, Gregory PJ, Malesker MA. 2013. Probiotics: History and Evolution. J Anc Dis Prev Rem 1:107.

- Lauzon HLL, Dimitroglou A, Merrifield DL, Ringo E, Davies SJ. 2014. Probiotics and Prebiotics: Concepts, Definitions and History. In Aquaculture Nutrition: Gut Health, Probiotics and Prebiotics, First Edition. Edited by Daniel Merrifield and Einar Ringø. © 2014 John Wiley & Sons, Ltd. Published 2014 by John Wiley & Sons, Ltd.
- Soccol CR, de Souza Vandenberghe, Spier MR, et al. 2010. The Potential of Probiotics, Food Technol. Biotechnol. 48:413-434.

Module 2. Classification and physiology: Lactic acid bacteria (LAB)

- Axelsson L. 1998. Lactic acid bacteria: Classification and Physiology. Ch. 1. In Lactic acid bacteria, Microbiology and Functional Aspects. Salminen S and von Wright A, Editors. Marcel Dekker, Inc. New York. Basel.
- Stiles MH, Wilhelm H, Holzapfel WH. 1997. Lactic acid bacteria of foods and their current taxonomy. International Journal of Food Microbiology 36:1-29.

Module 3. Classification and physiology: *Bifidobacterium* and *Propionibacterium*

- Sela DA, Price NPJ, Mills DA. 2010. Metabolism of Bifidobacteria. *In* Bifidobacteria: Genomics and Molecular Aspects (Edited by: Baltasar Mayo and Douwe van Sinderen). Caister Academic Press, U.K.
- Zarate G, 2012. Dairy Propionibacteria: Less Conventional Probiotics to Improve the Human and Animal Health. Ch 8. In "Probiotic in Animals", book edited by Everlon Cid Rigobelo. Published: October 3, 2012 under CC BY 3.0 license. © The Author(s).
- Poonam, Pophaly SD, Tomar SK, De S, Singh R. 2012. Multifaceted attributes of dairy propionibacteria: a review. World J Microbiol Biotechnol . 28:3081-95.

Module 4. Impact of genomics on the characterization of probiotics

- Frese SA, Benson AK, Tannock GW, Loach DM, Kim J, et al. 2011. The Evolution of Host Specialization in the Vertebrate Gut Symbiont *Lactobacillus reuteri*. PLoS Genet 7(2): e1001314.
- Van Pijkeren J-P, O'Toole PW. 2009. Comparative and Functional Genomics of the Genus *Lactobacillus*. *In Lactobacillus molecular biology: From genomics to probiotics*. Ed. Ljungh, A., & Wadström, T. Norfolk, UK: Caister Academic.
- Kelleher et al. 2017. Comparative and functional genomics of the *Lactococcus lactis* taxon; insights into evolution and niche adaptation. BMC Genomics 18:267.
- Lukjancenko O, Ussery DW, Wassenaar TM. 2012. Comparative Genomics of *Bifidobacterium*, *Lactobacillus* and Related Probiotic Genera. Microb Ecol. 63: 651–673.
- Lugli GA, Milani C, Turroni F, Duranti S, Mancabelli L, Mangifesta M, Ferrario C, Modesto M, Mattarelli P, Jiří K, van Sinderen D, Ventura M. 2017. Comparative genomic and phylogenomic analyses of the Bifidobacteriaceae family. BMC Genomics 18:568.

Unit 2. Biotechnological applications of Lactic acid bacteria

Module 5. The uses of LAB in food fermentation

- Shiby VK, Mishra HN. 2013. Fermented Milks and Milk Products as Functional Foods —A Review, Critical Reviews in Food Science and Nutrition 53:482-496.

- Zannini E, Waters DM, Coffey A, Arendt EK. 2016. Production, properties, and industrial food application of lactic acid bacteria-derived exopolysaccharides. Appl Microbiol Biotechnol. 100:1121-35.

- Leroy F, Verluyten J, De Vuyst L. 2006. Functional meat starter cultures for improved sausage fermentation. Int J Food Microbiol. 106:270-85.

Module 6. Antimicrobials components of LAB

- Alvarez-Sieiro P, Montalbán-López M, Mu D, Kuipers OP. 2016. Bacteriocins of lactic acid bacteria: extending the family. Appl Microbiol Biotechnol. 100:2939-51.

Module 7. Bacteriophages from LAB

- Mullan WMA. 2002. Morphology of bacteriophages for lactic acid bacteria. [On-line].

- Mahony J, McDonnell B, Casey E, van Sinderen D. 2016. Phage-Host Interactions of Cheese-Making Lactic Acid Bacteria. Annu Rev Food Sci Technol 7:267-85.

- Mahony J, Ainsworth S, Stockdale S, van Sinderen D. 2012. Phages of lactic acid bacteria: the role of genetics in understanding phage-host interactions and their co-evolutionary processes. Virology 434:143-50.

Module 8. Nutraceutics and high value metabolites produced by LABs

- Sauer M, Russmayer H, Grabherr R, Peterbauer CK, Marx H. 2017. The Efficient Clade: Lactic Acid Bacteria for Industrial Chemical Production. Trends Biotechnol. 35:756-769.

- Bosma EF, Forster J, Nielsen AT. 2017. Lactobacilli and pediococci as versatile cell factories - Evaluation of strain properties and genetic tools. Biotechnol Adv 35:419-442.

- Song AA, In LLA, Lim SHE, Rahim RA. 2017. A review on Lactococcus lactis: from food to factory. Microb Cell Fact 16:55. Erratum in: Microb Cell Fact. 2017 16:139.

- Lee NK, Paik HD. 2017. Bioconversion Using Lactic Acid Bacteria: Ginsenosides, GABA, and Phenolic Compounds. J Microbiol Biotechnol 27:869-877.

- Brown L, Pingitore EV, Mozzi F, Saavedra L, Villegas JM, Hebert EM. 2017. Lactic Acid Bacteria as Cell Factories for the Generation of Bioactive Peptides. Protein Pept Lett. 24:146-155.

Unit 3. Interactions of probiotics with the host immune system

Module 10. Immunomodulatory properties of probiotics: bacterial surface proteins

- Hynönen U, Palva A. 2013. *Lactobacillus* surface layer proteins: structure, function and applications. Appl Microbiol Biotechnol 97:5225-43.

- Sánchez B, Bressollier P, Urdaci MC. 2008. Exported proteins in probiotic bacteria: adhesion to intestinal surfaces, host immunomodulation and molecular cross-talking with the host. FEMS Immunol Med Microbiol 54:1-17

Module 11. Immunomodulatory properties of probiotics: interactions with the immune system

- O'Callaghan J, O'Toole PW. 2013. *Lactobacillus*: host-microbe relationships. Curr Top Microbiol Immunol. 358:119-54.

- Lebeer S, Vanderleyden J, De Keersmaecker SC. 2008. Genes and molecules of lactobacilli supporting probiotic action. Microbiol Mol Biol Rev. 72:728-64.

- Hevia A, Delgado S, Sánchez B, Margolles A. 2015. Molecular Players Involved in the Interaction Between Beneficial Bacteria and the Immune System. Front Microbiol 6:1285.

- Lebeer S, Vanderleyden J, De Keersmaecker SC. 2010. Host interactions of probiotic bacterial surface molecules: comparison with commensals and pathogens. Nat Rev Microbiol. 8:171-84.

- Tsai YT, Cheng PC, Pan TM. 2012. The immunomodulatory effects of lactic acid bacteria for improving immune functions and benefits. Appl Microbiol Biotechnol. 96:853-62.

Module 12. Engineering LAB and *Bifidobacterium* for mucosal delivery of heath-associated molecules

- Bosma EF, Forster J, Nielsen AT. 2017. Lactobacilli and pediococci as versatile cell factories - Evaluation of strain properties and genetic tools. Biotechnol Adv. 35:419-442.

- Song AA, In LLA, Lim SHE, Rahim RA. 2017. A review on *Lactococcus lactis*: from food to factory. Microb Cell Fact. 16:55. Erratum in: Microb Cell Fact 16:139.

- Bermúdez-Humarán LG, Aubry C, Motta JP, Deraison C, Steidler L, Vergnolle N, Chatel JM, Langella P. 2013. Engineering lactococci and lactobacilli for human health. Curr Opin Microbiol 16:278-83.

Unit 4. Probiotics safety and efficacy

Module 13. FAO/WHO Guidelines on Probiotics

- FAO/WHO. 2002. Guidelines for the evaluation of Probiotics in Food.

Module 14. Safety considerations on probiotics

- Salminen S, von Wright A, Morelli L, Marteau P, Brassart D, de Vos WM, Fondén R, Saxelin M, Collins K, Mogensen G, Birkeland SE, Mattila-Sandholm T. 1998. Demonstration of safety of probiotics -- a review. Int J Food Microbiol 44:93-106.

- Sanders ME, Akkermans LM, Haller D, Hammerman C, Heimbach J, Hörmannsperger G, Huys G, Levy DD, Lutgendorff F, Mack D, Phothirath P, Solano-Aguilar G, Vaughan E. 2010. Safety assessment of probiotics for human use. Gut Microbes 1:164-85.

- Vanderhoof JA, Young R. 2008. Probiotics in the United States. Clin Infect Dis. 46 Suppl 2:S67-72; discussion S144-51.

Module 15. Environmental factors influencing the efficacy of probiotic bacteria

- Marco ML, Tachon S. 2013. Environmental factors influencing the efficacy of probiotic bacteria. Curr Opin Biotechnol. 24:207-13.

Module 16. Efficacy of probiotics in Human Subjects

- Salminen S, Deighton MA, Benno Y, Gorbach SL. 1998. Lactic acid bacteria in health and disease. Ch 7. In Lactic acid bacteria, Microbiology and Functional Aspects. Salminen S and von Wright A, Editors. Marcel Dekker, Inc. New York. Basel.

- Vlasova AN, Kandasamy S, Chattha KS, Rajashekara G, Saif LJ. 2016. Comparison of probiotic lactobacilli and bifidobacteria effects, immune responses and rotavirus vaccines and infection in different host species. Vet Immunol Immunopathol. 172:72-84.

- McCollum DL, Martin Rodriguez J. 2012. Detection, Treatment, and Prevention of *Clostridium difficile* Infection. Clinical Gastroenterology and Hepatology 10: 581-592.

- Varankovich NV, Nickerson MT, Korber DR. 2015. Probiotic-based strategies for therapeutic and prophylactic use against multiple gastrointestinal diseases. Front Microbiol 6:685.

- NASPGHAN NUTRITION REPORT COMMITTEE. 2006. Clinical Practice Guideline Clinical Efficacy of Probiotics: Review of the Evidence With Focus on Children. J Pediatr Gastroenterol Nutr 43:550- 557.

- Bron PA, Kleerebezem M, Brummer RJ, Cani PD, Mercenier A, MacDonald TT, Garcia-Ródenas CL, Wells JM. 2017. Can probiotics modulate human disease by impacting intestinal barrier function? Br J Nutr. 117:93-107.

- Dimidi E, Christodoulides S, Fragkos KC, Scott SM, Whelan K. 2014. The effect of probiotics on functional constipation in adults: a systematic review and meta-analysis of randomized controlled trials. Am J Clin Nutr. 100:1075-84.

- Kim S, Lee H, Lee S, Lee J, Ha J, Choi Y, Yoon Y, Choi KH. 2017. Invited review: Microbe-mediated aflatoxin decontamination of dairy products and feeds. J Dairy Sci. 100:871-880.

- Azcárate-Peril MA, Sikes M, Bruno-Bárcena JM. 2011. The intestinal microbiota, gastrointestinal environment and colorectal cancer: a putative role for probiotics in prevention of colorectal cancer? Am J Physiol Gastrointest Liver Physiol. 301:G401-24.

- Czaja AJ. 2016. Factoring the intestinal microbiome into the pathogenesis of autoimmune hepatitis. World J Gastroenterol. 22:9257-9278.

- Mu Q, Kirby J, Reilly CM and Luo XM. 2017. Leaky Gut as a Danger Signal for Autoimmune Diseases. Front. Immunol. 8:598.

- Esmaeili SA, Mahmoudi M, Momtazi AA, Sahebkar A, Doulabi H, Rastin M. 2017. Tolerogenic probiotics: potential immunoregulators in Systemic Lupus Erythematosus. J Cell Physiol. 232:1994-2007.

- Gomes AC, Bueno AA, de Souza RG, Mota JF. 2014. Gut microbiota, probiotics and diabetes. Nutr J. 2014 13:60.

- Marinelli L, Tenore GC, Novellino E. 2017. Probiotic species in the modulation of the anticancer immune response. Semin Cancer Biol. 46:182-190.

Module 17. Probiotics in Animal Production and Health

- Hossain MI, Sadekuzzaman M, Ha SD. 2017. Probiotics as potential alternative biocontrol agents in the agriculture and food industries: A review. Food Res Int. 100:63-73.

- Angelakis E. 2017. Weight gain by gut microbiota manipulation in productive animals. Microb Pathog. 106:162-170.

- Chaucheyras-Durand F, Durand H. Probiotics in animal nutrition and health. 2010. Benef Microbes 1:3-9.

- C De B, Meena DK, Behera BK, Das P, Das Mohapatra PK, Sharma AP. 2014. Probiotics in fish and shellfish culture: immunomodulatory and ecophysiological responses. Fish Physiol Biochem. 40:921-71.

Unit 5. New frontiers in probiotic's development

Module 18. Overview on the microbiome

- Workshop Slides - JCVI Blog - J. Craig Venter Institute

- Blottière HM,de Vos WM, Ehrlich, D, Doré J. 2013. Human intestinal metagenomics: state of the art and future. Curr Opi Microbiol 16: 232-239.

- Morgan XC, Huttenhower C. 2012. Chapter 12: Human microbiome analysis. PLoS Comput Biol 8:e1002808.

- Morgan XC, Huttenhower C. 2014. Meta'omic analytic techniques for studying the intestinal microbiome. Gastroenterology 146:1437-1448.

- Human Microbiome Project
  https://commonfund.nih.gov/hmp/initiatives

Module 19. Manipulation of the microbiome by probiotics

- Tojo R, Suárez A, Clemente MG, de los Reyes-Gavilán CG, Margolles A, Gueimonde M, Ruas-Madiedo P. 2014. Intestinal microbiota in health and disease: role of bifidobacteria in gut homeostasis. World J Gastroenterol 20:15163-76.

- McFarland LV. 2014. Use of probiotics to correct dysbiosis of normal microbiota following disease or disruptive events: a systematic review. BMJ Open 4:e005047.

- Collado MC, Bäuerl C, Pérez-Martínez G. 2012. Defining microbiota for developing new probiotics. Microb Ecol Health Dis. 23.

- Walter J. 2008. Ecological role of lactobacilli in the gastrointestinal tract: implications for fundamental and biomedical research. Appl Environ Microbiol 74:4985-96.

Module 20. Microbiome research to identify new probiotic microorganisms

- Neef A, Sanz Y. 2013. Future for probiotic science in functional food and dietary supplement development. Curr Opin Clin Nutr Metab Care. 16:679-87.

- El Hage R, Hernandez-Sanabria E, Van de Wiele T. 2017. Emerging Trends in "Smart Probiotics": Functional Consideration for the Development of Novel Health and Industrial Applications. Front Microbiol 8:1889.

- Miquel S, Martín R, Rossi O, Bermúdez-Humarán LG, Chatel JM, Sokol H, Thomas M, Wells JM, Langella P. 2013. *Faecalibacterium prausnitzii* and human intestinal health. Curr Opin Microbiol. 16:255-61.

- Cani PD and de Vos WM. 2017. Next-Generation Beneficial Microbes: The Case of *Akkermansia muciniphila*. Front. Microbiol. 8:1765.

Module 21. Fecal transplants as probiotics

- Borody TJ, Paramsothy S., Agrawal G. 2013. Fecal Microbiota Transplantation: Indications, Methods, Evidence, and Future Directions. Curr Gastroenterol Rep. 15:337.

Module 22. Probiotics, prebiotics and symbiotics

- Rastall RA, Gibson GR. 2015. Recent developments in prebiotics to selectively impact beneficial microbes and promote intestinal health. Curr Opin Biotech 32:42-46.

- Pandey KR, Naik SR, Vakil BV. 2015. Probiotics, prebiotics and synbiotics- a review. J Food Sci Technol 52: 7577–7587.

- Patel R, DuPont HL. 2015. New Approaches for Bacteriotherapy: Prebiotics, New-Generation Probiotics, and Synbiotics. Clin Infec Dis 60:S108–S121.

- Pineiro M, Asp N-G, Reid G, Macfarlane S, Morelli L, Brunser O, Tuohy K. 2008. FAO Technical Meeting on Prebiotics. J Clin Gastroent 42:S156-S159.

- Markowiak P, Slizewska K. 2017. Effects of Probiotics, Prebiotics, and Synbiotics on Human Health. Nutrients 9:1021

Module 23. Psychobiotics: manipulation of bacteria–gut–brain signals

- Wasilewski A, Zielińska M, Storr M, Fichna J. 2015. Beneficial Effects of Probiotics, Prebiotics, Synbiotics, and Psychobiotics in Inflammatory Bowel Disease. Inflamm Bowel Dis. 21:1674-82.

- Liu X, Cao S, Zhang X. 2015. Modulation of Gut Microbiota-Brain Axis by Probiotics, Prebiotics, and Diet. J Agric Food Chem. 63:7885-95.

- Kim N, Yun M, Oh YJ, Choi HJ. 2018. Mind-altering with the gut: Modulation of the gut-brain axis with probiotics. J Microbiol. 56:172-182.

- Fung TC, Olson CA, Hsiao EY. 2017. Interactions between the microbiota, immune and nervous systems in health and disease. Nature Neuroscience 20:145–155.

- Powell N, Walker MM, Talley NJ. 2017. The mucosal immune system: master regulator of bidirectional gut–brain communications. Nat Rev Gastroent Hepat 14:143–159.

- Smith PA. 2015. The tantalizing links between gut microbes and the brain. Nature News. 14 October 2015.

MCB6937: Antimicrobial Resistance 3 credits

Course Description

UF Catalog: This course covers content related to antimicrobial resistance: the origins of antimicrobial resistance, dissemination, mechanisms, therapeutics, and impact on healthcare, agriculture, and the environment. This course mainly concentrates on resistance in bacteria, but will also discuss other organisms, including viruses, parasites, fungi, and cancer.

Course Importance: Cells are living factories that are capable of adapting their production line to any changes in the environment. Hence, cells encountering a toxic environment will evolve their machinery to maintain survival and replication. Such adaptation, called Antimicrobial Resistance, is commonly observed across bacteria, viruses, parasites, and fungi. However, only recently the overuse of antimicrobial agents created a high selection pressure to drive a wide-spread of resistance. While we are currently witnessing a constant increase of antimicrobial resistance, the development of novel treatments has almost completely ceased. This course will provide an extensive background on antimicrobial resistance, treatments, and respective mechanisms.

Time and Location

Online pre-recorded classes for the upcoming week (M-W-F lectures) will be made available every Sunday. New lectures are uploaded weekly onto Canvas (see access instructions below)

Instructor

Dr. Daniel Czyż (*chysh*)
Department of Microbiology and Cell Science
1355 Museum Drive
Office: Room 1004, Building 981
Phone: 352-392-0237
Email: dczyz@ufl.edu
Twitter: @360Science
Slack: AMR-UF, the app can be downloaded on a desktop, Android, or iOS
Preferred method of communication with the instructor regarding the course is by Slack

Office hours: Mondays 8-9 AM or by appointment
Virtual office hours: By appointment available through Canvas Video Conference (Blue Button) or a phone call

To request an office hours appointment, send an e-mail directly to the instructor with three suggested dates/times.

Instructor's Teaching Philosophy

"*Your work is going to fill a large part of your life, and the only way to be truly satisfied is to do what you believe is great work*" - Steve Jobs

You embrace education; devote your time to pursue your goals, strive for success, and do your best, but sometimes you are just hitting obstacles that prevent you from moving forward. That's when you wish you would have a good mentor. I've helped people who hit obstacles get right back on track, but more

importantly, I help my mentees and students avoid hitting obstacles in the first place. I always make sure I am available for my students and my colleagues, whether it's in a classroom or in a laboratory setting. As a scientist, I put a lot of time and emphasis on my trainees providing them with the right personalized support plan to guide them towards their short and long-term goals, as their success is my success. As an educator, my primary objectives are to retain students' attention, promote creativity and teamwork, and encourage out-of-classroom learning.

I find science to be the most fascinating and exciting subject to teach, mostly because it is never fully explored and with the ongoing new discoveries, teaching becomes learning. Science can be found in our everyday life and I believe that relating new information to practical application in daily lives focuses students' attention and enhances learning. For that reason, I link my lecture material to everyday applications as much as possible.

I encourage and expect students to employ out-of-textbooks material, including public databases, online tools, and primary literature. While independent projects are important, in science, single-person projects are nearly nonexistent. I strongly believe that assigning students to group projects strengthens their team-building core, helps to develop essential communication skills, and exposes students to conflicts and teaches them how to deal with them. Most importantly, an assignment might seem difficult for an individual student but becomes trivial when done as a team.

Finally, I put emphasis on mentorship and participation in extracurricular activities. My students are expected to mentor each other because it will help them develop essential skills in their future careers. It's never too early to become a mentor. Finally, I truly believe that building a career is not solely attained during classroom education. Participation in community outreach events, conferences, seminars, and symposia is just as important as classroom-based learning. These extracurricular activities build leadership and improve communication skills and I strongly encourage my students to participate in such activities.

Course Level & Prerequisites

The course is designed for both undergraduate-level and graduate students.
The course requires graduate students to have a Bachelor's degree in biology or a related field.
Important concepts will be briefly reviewed to provide students with a better understanding of the subject.

Course Objectives

After completion of this course, students should be able to:

- Outline problems associated with antimicrobial resistance across healthcare, agriculture, and the environment
- Explain resistance mechanisms in viruses, fungi, parasites, and cancer
- Identify major classes of antibiotics and their respective mechanisms of action
- Describe known mechanisms of antibiotic resistance and modes of transmission
- Identify means of detection/assessment of antibiotic resistance
- Describe therapeutic approaches used to fight antibiotic resistance
- Recognize scientific terms related to antimicrobial resistance
- Assess risks associated with antibiotic-resistant infections
- Employ online databases to utilize genomic, chemical, and epidemiological data on AMR

Learning Assessment

Grades are used to assess your learning progress. The vast extent of the information covered by this course should not discourage students. This course is designed to teach you and not fail you. If you encounter any learning difficulties that will affect your grades/learning progress, contact the professor as soon as possible.

GRADING SCALE (total: 830 pts)

	Graduate Students	
	Percentage	Score range
A	>93.4	>775
A-	93.3-90.0	774-747
B+	89.9-86.6	746-719
B	86.5-83.4	718-692
B-	83.3-80.0	691-664
C+	79.9-76.5	663-635
C	76.4-73.3	634-608
C-	73.2-70.0	607-581
D+	69.9-66.6	580-553
D	66.5-63.3	552-525
D-	63.2-60.0	524-498
E	<60.0	<498

EXAMS (700 pts):

Exam I, February 5, 2020: Covers lectures 1-11. (100 pts)
Exam II, March 11, 2020: Covers lectures 1-23. (200 pts)
Exam III, April 1, 2020: Covers lectures 24-32. (100 pts) – this is not a joke!
Exam IV, April 27, 2020: Covers lectures 1-43 (300 pts)

Exams will assess student knowledge of the material covered in lectures, assignments, and required reading/video material. The lowest exam score (either Exam I or III only) will be dropped. All exams are mandatory and only students who take all four exams will be able to drop one. Each exam will take approximately 50 minutes (final exam will take 2x time) to complete and will consist of multiple-choice questions, true/false, fill in the blanks, sentence completion, definition matching, and short-answer questions. Students must sign up on ProctorU at least 72 hours in advance. The academic honesty will be remotely monitored in real-time by assigned course proctors. For more information about academic honesty, please see the **Student Honor Code**.

QUIZZES (100 pts):

There will be 11 quizzes (10 points each, 100 points total plus 10 extra credit points). See the Course Content (below) for dates. Quizzes will cover lecture material and assigned reading/video material. There will be one Extra Credit Quiz during the first week. This will be an introductory quiz that will cover students' understanding of the syllabus and course requirements.

WRITING ASSIGNMENTS (130 pts):

At the end of every Monday lecture, the instructor will assign a reading/video. Written assignments will be due every Sunday (11:59 PM EST) following the introduction of the assignment. Only graduate students

registered for the course have to turn in the written assignments. There will be 13 written assignments worth 10 points each for a total of 130 points. Graduate students are required to provide a brief answer to questions that relate to each assigned reading/video in a single abstract form (sample abstract is provided with Assignment No. 1). The response should not take more than 250 words in total – adhering to this limit is a must. The purpose of these assignments is to link the course material to real cases, encourage creative thinking, and assess your learning. See "Late Submission" for information related to late work. See the "Assignments" section for more details.

EXTRA CREDIT: The professor may offer an extra credit written assignment.

Grades and Grade Points

For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/.

Late Submission

Graduate students who turn in late writing assignments will be penalized 10% of the total score for each late day up to three days. After three days, no late submissions will be accepted. Students with special medical or family problems should contact the instructor directly.

Attendance and Make-Up Work

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:
https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/.

Website

Course material can be accessed through Canvas.
https://ufl.instructure.com/

Technical issues related to the course can be addressed to UF helpdesk
http://helpdesk.ufl.edu, 352-393-4357, helpdesk@ufl.edu

Communication

For questions and issues on assignments and class organization please check first the syllabus, the announcements, calendar, and the Course Handout. To seek further help, please communicate with the instructor via **Slack** or email. For questions regarding class and class content use the Canvas **Discussion Board**.

Discussion Board: Available through Canvas. Postings and answers are monitored by the instructor
Slack: AMR-UF, the app can be downloaded on a desktop, Android, or iOS
Twitter: Follow and share science news related to the course using #AMR_UF

IMPORTANT: *Prior to the first lecture, please familiarize yourself with netiquette (cyber behavior guidelines). See below "Netiquette guide for online courses".*

Students should expect to receive prompt responses, feedback, and grades:
-Quizzes and Exams: within three days of completion
-Assignments: within two weeks of submission
-Communication: between 0-24 h

Course Material

Required material: There is no textbook for this course. This course is based on peer-reviewed publications that will be provided by the instructor. The required reading material will be posted under "Assignments" in Canvas. Questions related to information from the required reading/video material will appear on quizzes and exams.

Recommended reading and other material: Additional reading material, links to videos, and other online resources will be posted under "Files" in Canvas.

Services for Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, https://disability.ufl.edu/

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

These resources include:

Health & Wellness

- U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or tel. 352-392-1575 so that a team member can reach out to the student. http://www.umatter.ufl.edu/
- University Counseling and Wellness Center: Provides counseling services to students 3190 Radio Road. Tel. 352-392-1575. https://counseling.ufl.edu/
    - Counseling Services
    - Groups and Workshops
    - Outreach and Consultation
    - Self-Help Library

    - Wellness Coaching
- Sexual Assault Recovery Services (SARS): Provides services related to sexual violence. Tel. 352-392-5648. http://www.umatter.ufl.edu/sexual_violence
- Student Health Care Center: Student health-related services. Tel. 352-392-1161. https://shcc.ufl.edu/
- Gator Career Closet: Serves as a lending closet for students to borrow professional clothing and accessories free of charge. This service is available to all UF students with a valid UF ID. Tel. 352-392-1601. https://career.ufl.edu/careercloset/
- Food Pantry: Offers non-perishable food, toiletries, and fresh vegetables. This service is provided to current students, staff, and faculty at the University of Florida. Gator 1 ID is required, but no proof of need is required.

For emergencies call the University Police Department at 352-392-1111 (or 911).

Academic Resources

E-learning technical support: Tel. 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Connection Center, First Floor JWRU: Career assistance and counseling. Tel. 352-392-1601. https://career.ufl.edu/.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources. Text 813-463-2283 or Tel. 866-281-6309. http://cms.uflib.ufl.edu/ask

Teaching Center, Broward Hall: General study skills and tutoring. Tel. 352-392-2010 or 352-392-6420. http://teachingcenter.ufl.edu/

Writing Studio, 302 Tigert Hall: Help brainstorming, formatting, and writing papers. Tel. 352-846-1138. http://writing.ufl.edu/writing-studio/

Online Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at: https://gatorevals.aa.ufl.edu/public-results/.

Setting up VPN

To access UF resources and journal articles off-campus, please set up a Virtual Private Network (VPN). VPN allows you to remotely connect to UF services (i.e. library, UF servers). For detailed instructions on how to set up VPN visit: https://it.clas.ufl.edu/kb/category/vpn/

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors.
These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity*." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*." It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code. If you have any questions or concerns, please consult with the instructor. Additional policies on academic integrity can be found in the Orange Book.

Additional comments regarding academic integrity:

Students are encouraged to discuss the course material with each other, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

- Have another person complete a quiz in this course
- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

The result of any infraction will be consistent with university policy - see "Academic Honesty".

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.

Microsoft Office 365 Software is free for UF students
http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:
http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

The University of Florida and most instructors believe strongly in the ability of students to express concerns regarding their experiences at the University. Most problems, questions and concerns about the course will be resolved by professionally communicating with the instructor. Please try to meet your instructor in person, make an appointment to call, or try to set up a remote meeting through Skype or other media. The University encourages its students who still wish to file a written complaint to submit that complaint directly to the department that manages that policy. For more information visit:

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code/.
- Online Course: http://www.distance.ufl.edu/student-complaint-process

Professionalism is a two-way street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions may be delayed. If a student is lacking professionalism repeatedly, the instructor has the right to file a formal complaint against the student through the Dean of Student office.

Academic Calendar

Students should familiarize themselves with important academic dates and deadlines available at https://catalog.ufl.edu/UGRD/dates-deadlines/

Course Content

Week	Lecture	Date	Lecture topic	Due
	1	01/06/20	Course Introduction; Antimicrobial Resistance in Healthcare	
1	2	01/08/20	Antimicrobial Resistance in Agriculture	Extra Credit Quiz
	3	01/10/20	Antimicrobial Resistance in the Environment	Assignment 1
	4	01/13/20	Penicillin Discovery and Mechanism of Action	
2	5	01/15/20	Antibiotics: Cell Wall Synthesis Inhibitors, Part I	Quiz 1
	6	01/17/20	Antibiotics: Cell Wall Synthesis Inhibitors, Part II	Assignment 2
	No Class	01/20/20	*Happy Martin Luther King Day*	
3	7	01/22/20	Antibiotics: Folate Synthesis Inhibitors	Quiz 2
	8	01/24/20	Antibiotics: Protein Synthesis Inhibitors, Part I	
	9	01/27/20	Antibiotics: Protein Synthesis Inhibitors, Part II	
4	10	01/29/20	Antibiotics: Other Mechanisms of Action & the Future	Quiz 3
	11	01/31/20	Antibiotics: Toxicity and Side Effects	Assignment 3
	12	02/03/20	Lecture 1-11 Exam Review	
5	13	02/05/20	No Lecture, Exam I covering lectures 1-11	EXAM
	14	02/07/20	Antibiotic Resistance: Overview	Assignment 4
	15	02/10/20	Antibiotic Resistance: Modification/Destruction of Antibioitics	
6	16	02/12/20	Antibiotic Resistance: Efflux Pumps & Porins	Quiz 4
	17	02/14/20	Antibiotic Resistance: Target Modification	Assignment 5
	18	02/17/20	Antibiotic Resistance: Bacterial Biofilms	
7	19	02/19/20	Multidrug Resistant Bacteria: No ESKAPE	Quiz 5
	20	02/21/20	Multidrug Resistant Bacteria: MRSA/VRSA	Assignment 6
	21	02/24/20	Antibiotic Resistance Reservoirs	
8	22	02/26/20	Modes of Transmission	Quiz 6
	23	02/28/20	Antimicrobial Resistance in Sexually Transmitted Infections	Assignment 7
	No Class	03/02/20		
9	No Class	03/04/20	*Have a safe spring break* 	
	No Class	03/06/20		
	24	03/09/20	Lecture 1-23 Exam Review	Evaluation*
10	25	03/11/20	No Lecture, Exam II covering lectures 12-23	EXAM/Quiz 7
	26	03/13/20	Antimicrobial Resistance Assessments, Part I	Assignment 8
	27	03/16/20	Antimicrobial Resistance Assessments, Part II	
11	28	03/18/20	Therapeutics: Hunt for Novel Antibiotics	Quiz 8
	29	03/20/20	Therapeutics: Host-targeted Therapeutics, Part I	Assignment 9
	30	03/23/20	Therapeutics: Host-targeted Therapeutics, Part II	
12	31	03/25/20	Therapeutics: Alternative Medicine	Quiz 9
	32	03/27/20	Prophylaxis and Control Measures	Assignment 10
	33	03/30/20	Lecture 24-32 Exam Review	
13	34	04/01/20	No Lecture, Exam III covering lectures 24-32	EXAM III
	35	04/03/20	Antimicrobial Resistance: Viral Infections, Part I	Assignment 11
	36	04/06/20	Antimicrobial Resistance: Viral Infections, Part II	
14	37	04/08/20	Antimicrobial Resistance: Fungal Infections, Part I	Quiz 10
	38	04/10/20	Antimicrobial Resistance: Fungal Infections, Part II	Assignment 12
	39	04/13/20	Antimicrobial Resistance: Parasitic Infections, Part I	
15	40	04/15/20	Pesticide Resistance: Genetically Modified Organisms	
	41	04/17/20	Drug Resistance in Cancer	Assignment 13
	42	04/20/20	Lectures 1-23 Final Exam Review	Evaluation**
16	43	04/22/20	Lectures 24-43 Final Exam Review	
	No Class	04/24/20	Reading Day	
	No Class	04/27/20	Final Exam	
17	No Class	04/29/20	*Have a safe Summer* 	
	No Class	05/01/20		

*Required informal course and instructor evaluation

**Final and official course evaluation

Assignments

Week	Lecture	Date	Assigned Reading *	Assignment
	1	01/06/20	Antibiotic Resistance Threats in the US	Hunting the Nightmare Bacteria
1	2	01/08/20	Reducing Antimicrobial Use in Food Animals	
	3	01/10/20	Antibiotic-Resistance Genes in Wastewater	
	4	01/13/20	Discovery of penicillin	Hunting the Nightmare Bacteria
2	5	01/15/20	Antibiotic Use in Fish Industry	
	6	01/17/20	Water Sustainability and Public Health Goals	
	No Class	01/20/20	Gram-negative vs Gram-positive	No Assignment
3	7	01/22/20	Bacterial Wall as Target to Attack	
	8	01/24/20	Future of AMR	
	9	01/27/20	Discovery of tetracycline	Hunting the Nightmare Bacteria
4	10	01/29/20	Antibiotic for Emerging Pathogens	KPC Outbreak
	11	01/31/20	Other approaches	
	12	02/03/20	No reading assigned	TED Talk: Antibiotic Resistance
5	13	02/05/20	No reading assigned	
	14	02/07/20	The Origin and Molecular Basis of Antibiotic Resistance	
	15	02/10/20	Enzymatic Degradation and Modification	Antibiotics in Healthy Animals
6	16	02/12/20	Efflux Pumps in ABR	
	17	02/14/20	Modified Target Sites	
	18	02/17/20	ABR of Bacterial Biofilms	CARD
7	19	02/19/20	No ESKAPE!	
	20	02/21/20	MRSA	
	21	02/24/20	Reservoirs of AMR	STITCH
8	22	02/26/20	HGT Warfare	
	23	02/28/20	AMR in STIs	
	No Class	03/02/20	No reading assigned	No Assignment
9	No Class	03/04/20	No reading assigned	
	No Class	03/06/20	No reading assigned	
	24	03/09/20	No reading assigned	PubChem
10	25	03/11/20	No reading assigned	
	26	03/13/20	Antimicrobial Susceptibility Testing	
	27	03/16/20	Diagnosing AMR	Resistance Map
11	28	03/18/20	Platforms for Antibiotic Discovery	
	29	03/20/20	Host-directed Antimicrobial Drug Discovery	
	30	03/23/20	Targeting host metabolism	Phage Treatment of P. aeruginosa
12	31	03/25/20	Revising Natural Products	
	32	03/27/20	National Action Plan for Combating ABR	-
	33	03/30/20	No reading assigned	Antimicrobial Peptides
13	34	04/01/20	No reading assigned	
	35	04/03/20	Antiviral Drug Resistance	
	36	04/06/20	Influenza Antiviral Drug Resistance	FDA Drug Repurposing
14	37	04/08/20	Antifungal Agents: Mechanisms of Action	
	38	04/10/20	Antifungal Agents	
	39	04/13/20	Antiparasitic Chemotherapy	Protecting Yourself & Family
15	40	04/15/20	GM crops	
	41	04/17/20	Cancer Drug Resistance	
	42	04/20/20	No reading assigned	No Assignment
16	43	04/22/20	No reading assigned	
	No Class	04/24/20	No reading assigned	
	No Class	04/27/20	No reading assigned	No Assignment
17	No Class	04/29/20		
	No Class	05/01/20		

*All assigned reading will be posted on Course Canvas in pdf format

MCB6937 Special topics: Regulatory aspects of microbiome research (1 credit hour)

Fall 2022

Course Description: MCB6937 will cover guidelines published by the Food and Drug Administration for live biotherapeutic products, basic aspects of clinical research and primary research papers covering various aspects of the use of microbiome-derived species to modulate the health status in the host.

Prerequisite Knowledge and Skills: Basic microbiology or biology. Basic understanding of statistics is expected.

Purpose of Course: The purpose of this course is to guide students on the requirements and steps needed to study new therapeutic microbial strains in the human host. Students will read and analyze primary research literature in clinical trials and gain knowledge on the design of clinical trials and current regulatory pathways for live biotherapeutic products.

Student Learning outcomes – After successful completion of this course, students will be able to:

- Read primary research publications (papers) in the microbiome
- Learn the regulatory pathways available for live biotherapeutic products
- Understand the elements needed in different types of clinical trials.
- Evaluate primary literature on clinical trials and the methods utilized
- Comprehend data presented in figures, tables, and text within research papers
- Determine if experiments have been conducted with appropriate controls
- Determine if research conclusions for specific experiments and the paper overall are justified by the presented data
- Examine the current literature for related papers and discuss those papers
- Understand the difference between a primary research paper and a review or news piece.
- Examine the different regulatory pathways available for microbiome products
- Understand the differences between food supplements, medical foods and biologics
- Learn the FDA/CBER guidelines for the development and testing of live biotherapeutic products

INSTRUCTOR:

Graciela L Lorca, PhD
Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

WebPage: Canvas (https://ufl.instructure.com/). Please select MCB6937 section TBD.

On line help with classroom technology: http://helpdesk.ufl.edu/

Communication: for questions regarding class and paper assignments use the Discussion Board, for issues on Home Work Assignments, class organization check first the syllabus, the announcements and calendar on Canvas, then post your questions on the discussion board. For all other issues contact the instructors through CANVAS email ONLY.

VIRTUAL OFFICE HOURS: are available on demand through Zoom Conferences in Canvas. To request an appointment, send an e-mail with three suggested times and we will choose one for us to meet.

Contact Information: Use TEACHER in your emails through Canvas ONLY (personal emails should only be used in a case of emergency only)

Dr. Graciela L Lorca:
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use glorca@ufl.edu)
Phone: 273 8090 (please leave a message).

- **Discussion Board:** A discussion board is available in Canvas. It is very useful, please post and answer your questions on class content and organization there. Postings and answers are monitored by the instructor to make sure no mistakes get propagated. There are several discussion themes. Please post your questions in the adequate section.

Required Text: There is no assigned text book. Assigned research publications will be posted on the course web page.

Material: This course is based on peer reviewed papers either available for free through the links provided or through the UF library (ejournals). Remember to connect to UF through VPN (if outside campus) before accessing the journals (https://connect.ufl.edu/it/wiki/pages/glvpn.aspx).

Assessment of learning

Assignments (700 points): Activities will be assigned by module. The activities include online research, use of online tools, and graded quizzes. The goal of these assignments is that the student keep-up with reading of the material on weekly basis. **The activities**

are mandatory and count towards the final grade. They should be completed by the deadline indicated on Canvas.

Critical integrative review (300 points): The final paper will involve the search and writing of a critical review of at least 5 scientific articles on a study case (original research, review articles are NOT allowed). The student will have to complete the review which contains the following three mandatory aspects: (1) live biotherapeutic discovery, (2) preclinical, and (3) clinical.

Make-Up policy: Make-up assignments will ONLY be allowed with a VALID justification. If one assignment is missed, it will result in a score of 0 (see below for "Excused absences").

Excused absences:
Documentation MUST be provided for absences caused by serious illness, accident, jury duty, or death in the immediate family. You must contact the instructor **as soon as possible** of the missed assignment and I will arrange an alternative time for the submission.

Requirements for class attendance and make-up assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Grades and Grade Points
For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Grading: Straight scale

Grading Scale

A	900 or above
A-	860-899
B+	830-859
B	790-829
B-	750-789
C+	720-749
C	690-719
C-	660-689
D+	630-659
D	600-629
D-	570-599
E	560 or below

Course content

Unit	Module. Topic
Unit 1	**Methods to study the role of the Microbiota in Health and Disease**
	1. Role of the microbiota in Health and Disease
	2. Preclinical models to study the microbiome
	3. Clinical research: Protocols and IRB
Unit 2	**Live biotherapeutic products: regulatory framework**
	4. Choosing the best regulatory pathway
	5. Dietary supplements
	6. Medical foods
	7. Biologics
	8. FDA/CBER guidelines for live biotherapeutics
Unit 3	**Case studies**
	9. "Traditional" probiotics
	10. "New" probiotics
	11. Fecal microbiota transplants
	12. Prebiotics
	13. Symbiotic
	14. Postbiotics

Readings and Sources

1. Gut microbiota in human metabolic health and disease. Fan Y, Pedersen O. Nat Rev Microbiol. 2021 Jan;19(1):55-71. doi: 10.1038/s41579-020-0433-9. Epub 2020 Sep 4. PMID: 32887946 Review.
2. The CRC guide to coordinating Clinical research. Fourth edition. 2019. Sandra Sather. WCG.
3. https://clinicaltrials.gov/ct2/home
4. Fostering next-generation probiotics in human gut by targeted dietary modulation: An emerging perspective. Kumari M, Singh P, Nataraj BH, Kokkiligadda A, Naithani H, Azmal Ali S, Behare PV, Nagpal R. Food Res Int. 2021 Dec;150(Pt A):110716. doi: 10.1016/j.foodres.2021.110716. Epub 2021 Sep 30. PMID: 34865747 Review.
5. Discovery and delivery strategies for engineered live biotherapeutic products. Heavey MK, Durmusoglu D, Crook N, Anselmo AC. Trends Biotechnol. 2021 Sep 1:S0167-7799(21)00176-1. doi: 10.1016/j.tibtech.2021.08.002. Online ahead of print. PMID: 34481657 Review.
6. Live biotherapeutic products: the importance of a defined regulatory framework. Cordaillat-Simmons M, Rouanet A, Pot B. Exp Mol Med. 2020 Sep;52(9):1397-1406. doi: 10.1038/s12276-020-0437-6. Epub 2020 Sep 10. PMID: 32908212 Free PMC article. Review.
7. Live Biotherapeutic Products, A Road Map for Safety Assessment. Rouanet A, Bolca S, Bru A, Claes I, Cvejic H, Girgis H, Harper A, Lavergne SN, Mathys S,

Pane M, Pot B, Shortt C, Alkema W, Bezulowsky C, Blanquet-Diot S, Chassard C, Claus SP, Hadida B, Hemmingsen C, Jeune C, Lindman B, Midzi G, Mogna L, Movitz C, Nasir N, Oberreither M, Seegers JFML, Sterkman L, Valo A, Vieville F, Cordaillat-Simmons M. Front Med (Lausanne). 2020 Jun 19;7:237. doi: 10.3389/fmed.2020.00237. eCollection 2020. PMID: 32637416 Free PMC article.

8. U.S. Regulatory Considerations for Development of Live Biotherapeutic Products as Drugs. Dreher-Lesnick SM, Stibitz S, Carlson PE Jr. Microbiol Spectr. 2017 Oct;5(5). doi: 10.1128/microbiolspec.BAD-0017-2017. PMID: 28975881 Free article.

9. Food and microbiota in the FDA regulatory framework. Green JM, Barratt MJ, Kinch M, Gordon JI. Science. 2017 Jul 7;357(6346):39-40. doi: 10.1126/science.aan0836. PMID: 28684495 Free PMC article.
10. A proposed definition of microbiota transplantation for regulatory purposes. Hoffmann DE, Palumbo FB, Ravel J, Rowthorn V, von Rosenvinge E. Gut Microbes. 2017 May 4;8(3):208-213. doi: 10.1080/19490976.2017.1293223. Epub 2017 Mar 20.

University of Florida Policies

Grades and Grade Points
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Services for Students with Disabilities
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center (https://disability.ufl.edu/get-started/). 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.

Campus Helping Resources

Health and Wellness

- U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website (https://umatter.ufl.edu/) to refer or report a concern and a team member will reach out to the student in distress.

- Counseling and Wellness Center: Visit the Counseling and Wellness Center website (https://counseling.ufl.edu/) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website (https://shcc.ufl.edu/).
- University Police Department: Visit UF Police Department website (https://police.ufl.edu/) or call 352-392-1111 (or 9-1-1 for emergencies). UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website (https://ufhealth.org/emergency-room-trauma-center).
- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website (https://gatorwell.ufsa.ufl.edu/) or call 352-273-4450.

Academic Resources

- E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services (https://career.ufl.edu/).
- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources (https://uflib.ufl.edu/).
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring (https://teachingcenter.ufl.edu/).
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers (https://writing.ufl.edu/writing-studio/).
- Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information (https://sccr.dso.ufl.edu/policies/student-honor-%20code-student-conduct-code/).
- On-Line Students Complaints: View the Distance Learning Student Complaint Process (https://distance.ufl.edu/state-authorization-status/#student-complaint).

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. Guidance on how to give feedback in a professional and respectful manner is available at

https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Class demeanor

Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*" You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Additional comments regarding academic integrity:
Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

- Have another person complete a quiz in this course
- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open

- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

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.

Microsoft Office 365 Software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

Most problems, questions and concerns about the course will be resolved by professionally communicating with the instructors.

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

- Online Course: http://www.distance.ufl.edu/student-complaint-process.

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions maybe delayed.
If a student is lacking professionalism repeatedly, the instructor has the rights to file formal complaint against the student through the Dean of Student office.

MCB7922 JOURNAL COLLOQUY (1 credit hour)

Theme: Microbiome and Clinical Trials

Course Description: In this section of MCB7922 primary research papers covering various aspects of the Microbiome and their study in clinical trials are assigned for reading, analysis, and discussion in a bulletin board-type format.

Prerequisite Knowledge and Skills: Basic microbiology or biology and concurrent enrollment in another graduate level introduction to microbiology/infectious diseases course. A basic understanding of statistics is expected.

Purpose of Course: The purpose of this course is to guide students on how to read and analyze the primary research literature in microbiology and translation into therapies.

Student Learning outcomes – After successful completion of this course, students will be able to:

- Read primary research publications (papers) in the microbiome
- Understand the methods used in study
- Comprehend data presented in figures, tables, and text within research papers
- Constructively criticize the quality of presentation of figures and tables in research papers
- Determine if experiments have been conducted with appropriate controls
- Determine if appropriate statistics have been applied and interpreted
- Determine if research conclusions for specific experiments and the paper overall are justified by the presented data
- Participate in discussion about research papers in an informed, thoughtful, and thorough manner
- Examine the current literature for related papers and discuss those papers.
- Understand the difference between a primary research paper and a review or news piece.

INSTRUCTORS:

Graciela L Lorca, PhD
Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

Natalie A. Harrison PhD
Postdoctoral Associate
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

Monica F. Torrez Lamberti PhD
Postdoctoral Associate
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

Leandro Teixeira PhD
Postdoctoral Associate
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

WebPage: Canvas (https://ufl.instructure.com/). Please select MCB7922 section GLJC.

On line help with classroom technology: http://helpdesk.ufl.edu/

Communication: for questions regarding class and paper assignments use the Discussion Board, for issues on Home Work Assignments, class organization check first the syllabus, the announcements and calendar on Canvas, then post your questions on the discussion board. For all other issues contact the instructors through CANVAS email ONLY (chose all teachers option)

VIRTUAL OFFICE HOURS: are available on demand through Zoom Conferences in Canvas. To request an appointment, send an e-mail with three suggested times and we will choose one for us to meet.

Contact Information: Use TEACHER in your emails through Canvas ONLY (personal emails should only be used in a case of emergency only)

Dr. Graciela L Lorca:
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use glorca@ufl.edu)
Phone: 273 8090 (please leave a message).

- **Discussion Board:** A discussion board is available in Canvas. It is very useful, please post and answer your questions on class content and organization there. Postings and answers are monitored by the instructors to make sure no mistakes get propagated. There are several discussion themes. Please post your questions in the adequate section.

Required Text: There is no assigned text book. Assigned research publications will be posted on the course web page.

Instructional Methods

Material: A research paper is assigned for reading and review by posting the PDF on the course web page. This course is based on peer reviewed papers either available for free through the links provided or through the UF library (ejournals).

Remember to connect to UF through VPN (if outside campus) before accessing the journals (https://connect.ufl.edu/it/wiki/pages/glvpn.aspx).

Assessment of learning

Assignments (100% of the grade).

- **Weekly Quiz assignment** (50% of the grade). Each week a quiz with a definite deadline is posted for each paper. The quiz is aimed at enforcing the timely reading of the paper and directing thoughtful analysis of certain aspects of the paper. The quiz has a multiple choice format, and can be taken twice, the highest score will be recorded. The student will be able to see the wrong answers after the initial submission.

- **Weekly Discussion board** (50% of the grade) is posted for each paper, and all students must participate in the discussion by contributing an original comment. Higher grades for the discussion are earned by citing related literature in the discussion to varying degrees. Discussions will be graded on participation and the use of other publications.

  The default grade for a discussion post is 8. Appropriately citing other relevant PRIMARY research papers will earn 9, and discussing a primary paper in enough detail to show that you read it (i.e., citing figures and tables) will earn 10 points. If you used a primary research paper, you must label it in the reference list as a primary paper. If you do not indicate a primary paper, you still get 8.5, the grade for a review. If you mistakenly claim that a review is a primary paper, you will get a 7. Learning the difference between a primary research paper and a review is a major goal of this course.

Make-Up policy: Make-up assignments will ONLY be allowed with a VALID justification. If one assignment is missed, it will result in a score of 0 (see below for "Excused absences").

Excused absences:
Documentation MUST be provided for absences caused by serious illness, accident, jury duty, or death in the immediate family. You must contact the instructor **as soon as possible** of the missed assignment and I will arrange an alternative time for the submission.

Requirements for class attendance and make-up assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Grades and Grade Points
For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx
Grading: Straight scale

Grading Scale

A	900 or above
A-	860-899
B+	830-859
B	790-829
B-	750-789
C+	720-749
C	690-719
C-	660-689
D+	630-659
D	600-629
D-	570-599
E	560 or below

University of Florida Policies

Grades and Grade Points
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Attendance and Make-Up Work
Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Services for Students with Disabilities
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting disability.ufl.edu/students/get-started. 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.
The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting

accommodation

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

Campus Helping Resources
Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,* www.counseling.ufl.edu
  Counseling Services
  Groups and Workshops
  Outreach and Consultation
  Self-Help Library
  Wellness Coaching

- U Matter We Care, www.umatter.ufl.edu/

- *Career Connections Center,* First Floor JWRU, 392-1601, https://career.ufl.edu/.

Academic Resources
- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://elearning.ufl.edu/student-help-faqs/
- Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://www.crc.ufl.edu/
- Library Support, http://cms.uflib.ufl.edu/ask. 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. http://teachingcenter.ufl.edu/
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. http://writing.ufl.edu/writing-studio/

Course Evaluation

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.

Class demeanor

Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
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- Have another person complete a quiz in this course
- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).

- Use any materials provided by a previous student in the course

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.

Microsoft Office 365 Software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

Most problems, questions and concerns about the course will be resolved by professionally communicating with the instructors.

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

- Online Course: http://www.distance.ufl.edu/student-complaint-process.

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions maybe delayed.

If a student is lacking professionalism repeatedly, the instructor has the rights to file formal complaint against the student through the Dean of Student office.

MCB7922 JOURNAL COLLOQUY (1 credit hour)

Theme: Mechanisms in Host/Microbe interactions

Course Description: In this section of MCB7922 primary research papers covering various aspects of the microbiome and their interactions with the host are assigned for reading, analysis, and discussion in a bulletin board-type format.

Prerequisite Knowledge and Skills: Basic microbiology or biology and concurrent enrollment in another graduate level introduction to microbiology/infectious diseases course. A basic understanding of statistics is expected.

Purpose of Course: The purpose of this course is to guide students on how to read and analyze the primary research literature in microbiology and their interactions with human, animal and plant hosts.

Student Learning outcomes – After successful completion of this course, students will be able to:

- Read primary research publications (papers) in the microbiome
- Understand the methods used in study
- Comprehend data presented in figures, tables, and text within research papers
- Constructively criticize the quality of presentation of figures and tables in research papers
- Determine if experiments have been conducted with appropriate controls
- Determine if appropriate statistics have been applied and interpreted
- Determine if research conclusions for specific experiments and the paper overall are justified by the presented data
- Participate in discussion about research papers in an informed, thoughtful, and thorough manner
- Examine the current literature for related papers and discuss those papers.
- Understand the difference between a primary research paper and a review or news piece.

INSTRUCTORS: This course will be team taught

Daniel Czyz
Assistant Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

Melissa Jones
Assistant Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

Sarah Doore
Assistant Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

Joseph Larkin III
Associate Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

Graciela L Lorca, PhD
Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

WebPage: Canvas (https://ufl.instructure.com/). Please select MCB7922 section GLJC.

On line help with classroom technology: http://helpdesk.ufl.edu/

Communication: for questions regarding class and paper assignments use the Discussion Board, for issues on Home Work Assignments, class organization check first the syllabus, the announcements and calendar on Canvas, then post your questions on the discussion board. For all other issues contact the instructors through CANVAS email ONLY (chose all teachers option)

VIRTUAL OFFICE HOURS: are available on demand through Zoom Conferences in Canvas. To request an appointment, send an e-mail with three suggested times and we will choose one for us to meet.

Contact Information: Use TEACHER in your emails through Canvas ONLY (personal emails should only be used in a case of emergency only)

Daniel Czyz
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use dczyz@ufl.edu)
Phone: 321-392-0237 (please leave a message).

Dr. Melissa Jones:
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use mmk@ufl.edu)
Phone: 352-392-5923 (please leave a message).

Dr. Sarah Doore:
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use sdoore@ufl.edu)
Phone: 352-846-0953 (please leave a message).

Joseph Larkin III
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use jlarkin3@ufl.edu)
Phone: 352-392-6884 (please leave a message).

Dr. Graciela L Lorca:
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use glorca@ufl.edu)
Phone: 273 8090 (please leave a message).

- **Discussion Board:** A discussion board is available in Canvas. It is very useful, please post and answer your questions on class content and organization there. Postings and answers are monitored by the instructor to make sure no mistakes get propagated. There are several discussion themes. Please post your questions in the adequate section.

Required Text: There is no assigned text book. Assigned research publications will be posted on the course web page.

Instructional Methods

Material: A research paper is assigned for reading and review by posting the PDF on the course web page. This course is based on peer reviewed papers either available for free through the links provided or through the UF library (ejournals).
Remember to connect to UF through VPN (if outside campus) before accessing the journals (https://connect.ufl.edu/it/wiki/pages/glvpn.aspx).

Assessment of learning

Assignments (100% of the grade).

- **Weekly Quiz assignment** (50% of the grade). Each week a quiz with a definite deadline is posted for each paper. The quiz is aimed at enforcing the timely reading of the paper and directing thoughtful analysis of certain aspects of the paper. The quiz has a multiple choice format, and can be taken twice, the highest score will be recorded. The student will be able to see the wrong answers after the initial submission.

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Documentation MUST be provided for absences caused by serious illness, accident, jury duty, or death in the immediate family. You must contact the instructor **as soon as possible** of the missed assignment and I will arrange an alternative time for the submission.

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Grades and Grade Points
For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Grading: Straight scale

Grading Scale

A	900 or above
A-	860-899
B+	830-859
B	790-829
B-	750-789
C+	720-749
C	690-719
C-	660-689

D+	630-659
D	600-629
D-	570-599
E	560 or below

University of Florida Policies

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- University Police Department: Visit UF Police Department website (https://police.ufl.edu/) or call 352-392-1111 (or 9-1-1 for emergencies).
  UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website (https://ufhealth.org/emergency-room-trauma-center).

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Academic Resources

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- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services (https://career.ufl.edu/).
- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources (https://uflib.ufl.edu/).
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring (https://teachingcenter.ufl.edu/).
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers (https://writing.ufl.edu/writing-studio/).
- Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information (https://sccr.dso.ufl.edu/policies/student-honor-%20code-student-conduct-code/).
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Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Class demeanor

Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*" You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Additional comments regarding academic integrity:
Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

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- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

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.

Microsoft Office 365 Software is free for UF students

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University of Florida Complaints Policy and Student Complaint Process

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The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

- Online Course: http://www.distance.ufl.edu/student-complaint-process.

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions maybe delayed.
If a student is lacking professionalism repeatedly, the instructor has the rights to file formal complaint against the student through the Dean of Student office.

MCB7922 JOURNAL COLLOQUY (1 credit hour)

Theme: Microbiome-based Clinical Trials

Course Description: In this section of MCB7922 primary research papers covering various aspects of the Microbiome and their study in clinical trials are assigned for reading, analysis, and discussion in a bulletin board-type format.

Prerequisite Knowledge and Skills: Basic microbiology or biology and concurrent enrollment in another graduate level introduction to microbiology/infectious diseases course. A basic understanding of statistics is expected.

Purpose of Course: The purpose of this course is to guide students on how to read and analyze the primary research literature in microbiology and translation into therapies.

Student Learning outcomes – After successful completion of this course, students will be able to:

- Read primary research publications (papers) in the microbiome
- Understand the methods used in study
- Comprehend data presented in figures, tables, and text within research papers
- Constructively criticize the quality of presentation of figures and tables in research papers
- Determine if experiments have been conducted with appropriate controls
- Determine if appropriate statistics have been applied and interpreted
- Determine if research conclusions for specific experiments and the paper overall are justified by the presented data
- Participate in discussion about research papers in an informed, thoughtful, and thorough manner
- Examine the current literature for related papers and discuss those papers.
- Understand the difference between a primary research paper and a review or news piece.

INSTRUCTORS:

Graciela L Lorca, PhD
Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

WebPage: Canvas (https://ufl.instructure.com/). Please select MCB7922 section GLJC.

On line help with classroom technology: http://helpdesk.ufl.edu/

Communication: for questions regarding class and paper assignments use the Discussion Board, for issues on Home Work Assignments, class organization check first the syllabus, the announcements and calendar on Canvas, then post your questions on the discussion board. For all other issues contact the instructors through CANVAS email ONLY (chose all teachers option)

VIRTUAL OFFICE HOURS: are available on demand through Zoom Conferences in Canvas. To request an appointment, send an e-mail with three suggested times and we will choose one for us to meet.

Contact Information: Use TEACHER in your emails through Canvas ONLY (personal emails should only be used in a case of emergency only)

Dr. Graciela L Lorca:
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use glorca@ufl.edu)
Phone: 273 8090 (please leave a message).

- **Discussion Board:** A discussion board is available in Canvas. It is very useful, please post and answer your questions on class content and organization there. Postings and answers are monitored by the instructor to make sure no mistakes get propagated. There are several discussion themes. Please post your questions in the adequate section.

Required Text: There is no assigned text book. Assigned research publications will be posted on the course web page.

Instructional Methods

Material: A research paper is assigned for reading and review by posting the PDF on the course web page. This course is based on peer reviewed papers either available for free through the links provided or through the UF library (ejournals).
Remember to connect to UF through VPN (if outside campus) before accessing the journals (https://connect.ufl.edu/it/wiki/pages/glvpn.aspx).

Assessment of learning

Assignments (100% of the grade).

- **Weekly Quiz assignment** (50% of the grade). Each week a quiz with a definite deadline is posted for each paper. The quiz is aimed at enforcing the timely reading of the paper and directing thoughtful analysis of certain aspects of the paper. The quiz has a multiple choice format, and can be taken twice, the highest score will be recorded. The student will be able to see the wrong answers after the initial submission.

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  The default grade for a discussion post is 8. Appropriately citing other relevant PRIMARY research papers will earn 9, and discussing a primary paper in enough detail to show that you read it (i.e., citing figures and tables) will earn 10 points. If you used a primary research paper, you must label it in the reference list as a primary paper. If you do not indicate a primary paper, you still get 8.5, the grade for a review. If you mistakenly claim that a review is a primary paper, you will get a 7. Learning the difference between a primary research paper and a review is a major goal of this course.

Make-Up policy: Make-up assignments will ONLY be allowed with a VALID justification. If one assignment is missed, it will result in a score of 0 (see below for "Excused absences").

Excused absences:
Documentation MUST be provided for absences caused by serious illness, accident, jury duty, or death in the immediate family. You must contact the instructor **as soon as possible** of the missed assignment and I will arrange an alternative time for the submission.

Requirements for class attendance and make-up assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Grades and Grade Points
For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Grading: Straight scale

Grading Scale

A	900 or above
A-	860-899
B+	830-859
B	790-829
B-	750-789
C+	720-749
C	690-719
C-	660-689

D+	630-659
D	600-629
D-	570-599
E	560 or below

University of Florida Policies

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- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website (https://shcc.ufl.edu/).

- University Police Department: Visit UF Police Department website (https://police.ufl.edu/) or call 352-392-1111 (or 9-1-1 for emergencies).
  UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website (https://ufhealth.org/emergency-room-trauma-center).

- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website (https://gatorwell.ufsa.ufl.edu/) or call 352-273-4450.

Academic Resources

- E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services (https://career.ufl.edu/).
- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources (https://uflib.ufl.edu/).
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring (https://teachingcenter.ufl.edu/).
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers (https://writing.ufl.edu/writing-studio/).
- Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information (https://sccr.dso.ufl.edu/policies/student-honor-%20code-student-conduct-code/).
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Course Evaluation

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MCB7922 JOURNAL COLLOQUY (1 credit hour)

Theme: Virome

Course Description: In this section of MCB7922 primary research papers covering various aspects of the virome and their interactions with the host are assigned for reading, analysis, and discussion in a bulletin board-type format.

Prerequisite Knowledge and Skills: Basic microbiology or biology and concurrent enrollment in another graduate level introduction to microbiology/infectious diseases course. A basic understanding of statistics is expected.

Purpose of Course: The purpose of this course is to guide students on how to read and analyze the primary research literature in microbiology and their interactions with human, animal and plant hosts.

Student Learning outcomes – After successful completion of this course, students will be able to:

- Read primary research publications (papers) in the virome
- Understand the methods used in study
- Comprehend data presented in figures, tables, and text within research papers
- Constructively criticize the quality of presentation of figures and tables in research papers
- Determine if experiments have been conducted with appropriate controls
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- Determine if research conclusions for specific experiments and the paper overall are justified by the presented data
- Participate in discussion about research papers in an informed, thoughtful, and thorough manner
- Examine the current literature for related papers and discuss those papers.
- Understand the difference between a primary research paper and a review or news piece.

INSTRUCTORS: This course will be team taught

Melissa Jones
Assistant Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

Sarah Doore
Assistant Professor
Department of Microbiology and Cell Science
College of Agricultural and Life Sciences

WebPage: Canvas (https://ufl.instructure.com/). Please select MCB7922.

On line help with classroom technology: http://helpdesk.ufl.edu/

Communication: for questions regarding class and paper assignments use the Discussion Board, for issues on Home Work Assignments, class organization check first the syllabus, the announcements and calendar on Canvas, then post your questions on the discussion board. For all other issues contact the instructors through CANVAS email ONLY (chose all teachers option)

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Contact Information: Use TEACHER in your emails through Canvas ONLY (personal emails should only be used in a case of emergency only)

Dr. Melissa Jones:
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use mmk@ufl.edu)
Phone: 352-392-5923 (please leave a message).

Dr. Sarah Doore:
Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the e-learning platform and need to contact me for an **emergency**, use sdoore@ufl.edu)
Phone: 352-846-0953 (please leave a message).

- **Discussion Board:** A discussion board is available in Canvas. It is very useful, please post and answer your questions on class content and organization there. Postings and answers are monitored by the instructor to make sure no mistakes get propagated. There are several discussion themes. Please post your questions in the adequate section.

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Assessment of learning

Assignments (100% of the grade).

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Grading: Straight scale

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- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources (https://uflib.ufl.edu/).
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring (https://teachingcenter.ufl.edu/).
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers (https://writing.ufl.edu/writing-studio/).
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JOURNAL COLLOQUY – FINAL LITERATURE REVIEW

MCB 7922 Section: 31394
Class Periods: Asynchronous
Location: e-Learning Canvas
Academic Term: Fall, Spring, Summer

Instructor:
Jamie Foster, Ph.D.
jfoster@ufl.edu
321-525-1047
Office Hours: available by appointment via Zoom

Course Description – 1 credit

Critical presentation and synthesis of recent original articles in the microbiological literature. Specifically, this course will help students prepare and generate their literature review for the final MS program assessment.

Course Pre-Requisites / Co-Requisites

Students must be in their final semester of coursework.

Course Objectives

The objectives of this course are to: 1) enhance graduate students' understanding of the current state of knowledge regarding the fields of microbiology and cell science; and 2) provide a framework in which students can synthesize that knowledge into a literature review that will be used as the student's programmatic final assessment.

Course Schedule

Week 1 & 2: Decide on topic for literature review and begin to accumulate references. Complete tutorials on reading the primary literature, and science writing.
Week 3: Complete plagiarism learning module
Week 4 & 5: Complete outline of proposed review paper and include list of references.
Week 6 &7: Submit a first draft of the literature review paper.
Week 8 - end: Revise the first draft and complete as many iterations as needed for passing of final draft of literature review.

Rubric for Final Draft of Review Paper

Online MS Program Final Draft Literature Review												
		Excellent		E/G	Good		G/F	Fair		Poor		Score
Introduction : Clear overview of paper, demonstrates the importance of the topic		10	9	8	7	6	5	4	3	2	1	0
Body	***Balanced View Point:*** Objective, balanced view from various perspectives and each cited study relates to the topic and to other studies	10	9	8	7	6	5	4	3	2	1	0
	Depth and breadth of research: Variety of studies and attention to detail about the topic	10	9	8	7	6	5	4	3	2	1	0
	Analysis: Collection of studies analysed for differences and/or commonalities about the topic	10	9	8	7	6	5	4	3	2	1	0
Conclusion and Synthesis: Information synthesized and brought to a logical conclusion		10	9	8	7	6	5	4	3	2	1	0
Organization, Mechanics and Alignment: Information logically organized with good flow. Issues threaded throughout the review. Correct spelling, punctuation, sentence structure, scientific names in italics, word usage		10	9	8	7	6	5	4	3	2	1	0
References and Citations: References correctly cited, appropriate number and quality		10	9	8	7	6	5	4	3	2	1	0
Total Score												

Attendance Policy, Class Expectations, and Make-Up Policy
As this course is online and asynchronous there is no required attendance. As this paper will be used as final assessment for the MS program and the graduate school requires the documents to be submitted at certain times throughout the academic year, therefore there is little flexibility for the final paper submission dates. However, if you have an excused absence for missing earlier tutorials or deadlines for the draft review paper, we can revise as needed. Excused absences must be consistent with university policies in the Graduate Catalog and require appropriate documentation. Additional information can be found in Attendance Policies.

Evaluation of Grades

Assignment	***Total Points***	***Percentage of Final Grade***
Plagiarism Module	5	5%
Outline of Review Paper	10	10%
First Draft of Review paper	15	15%
Final Draft of Review paper	70	70%
Total Points	100	100%

Grading Policy
The course will be evaluated on a straight scale. Those grades with a B or higher are considered a passing grade (grades highlighted in orange below) for the final programmatic assessment. Those students who do not receive a grade of B or higher would have to re-take the course again to pass the final assessment.

Percent	***Grade***	***Grade Points***
90.0 - 100.0	A	93 - 100
87.0 - 89.9	A-	90 - 92
84.0 - 86.9	B+	87 - 89
81.0 – 83.9	B	83 - 86
78.0 - 80.9	B-	80 - 82
75.0 - 79.9	C+	77 - 79
72.0 – 74.9	C	73 - 76
69.0 - 71.9	C-	70 - 72
66.0 - 68.9	D+	67 - 69
63.0 - 65.9	D	63 - 66
60.0 - 62.9	D-	60 - 62
0 - 59.9	E	< 60

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 Resources

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

MCB6937 Bacterial Physiology/ MCB4403 Prokaryotic Cell Structure and Function

University of Florida

Department of Microbiology and Cell Science

COURSE DESCRIPTION: This course explores the structure and physiology of bacterial cells. The principles of energy and biosynthetic metabolism will be examined in aerobic and anaerobic microorganisms. Several current research topics in microbiology will also be covered including microbial proteases, chaperones, chemotaxis, antimicrobial resistance, and adaptations of microbes in extreme environments.

Pre-requisites: CHM 2211; MCB 3020, MCB 3020L with minimum C. It is recommended that BCH 4024 or CHM 4207 be taken before or concurrent.

Credits: 3

Course Instructor:

Mariola J. Edelmann, Room 1048, Microbiology & Cell Science Department, Phone 352-846-0954, *medelmann@ufl.edu*

Office hours: Tuesday 3-5 PM or by appointment (e-mail preferred), including online students (phone or Skype conferences are used for online students)

CLASS MEETING/EXAM LOCATION:
Tuesdays | Period 9 (4:05 PM - 4:55 PM) Room: Microbiology and Cell Science Bldg. 981, Museum Road, Seminar Room 1044
Thursdays | Period 8 - 9 (3:00 PM - 4:55 PM) Room: Microbiology and Cell Science Bldg. 981, Museum Road, Seminar Room 1044

COURSE LEARNING OBJECTIVES:

- To become an expert on the structure & function of prokaryotic cells
- To gain the concepts and skills needed to understand and critically evaluate research articles that address the structure & function of prokaryotes
- To creatively apply the theories of prokaryotic cell physiology to current problems (e.g. controlling bacterial pathogens)

RECOMMENDED TEXTBOOK:

White, D., J. Drummond, C. Fuqua. 2012. The Physiology and Biochemistry of Prokaryotes. Fourth Edition. Oxford University Press. New York. ISBN13: 9780195393040, ISBN10: 019539304X.

CLASS LECTURES AND NOTES:

Class lectures and associated notes are available on the University of Florida E-learning in Canvas support services under 'modules' in video format with slide notes in pdf format. You can access this account from the LSS homepage (http://lss.at.ufl.edu/) using your GatorLink username and password. To obtain a GatorLink account, you will need to signup with a UF ID number at *https://my.ufl.edu/psp/ps_pwd/EMPLOYEE/EMPL/c/UF_PA_GL_ACCT_MGMT.UF_PA_SS_GL_CREATE.GBL*

EVALUATION OF LEARNING:

Each weekly topic will include online lectures, plus an assigned classic 'review paper' to read. Class lectures and associated notes will be available on the University of Florida E-learning in Canvas support services under 'modules' in video format. Slides are also available as PDF for download. Exam questions will be drawn from the lectures and review paper as described below. See details of grading scheme for (1) graduate (MCB6937) and (2) undergraduate (MCB4403) sections:

1. **MCB6937 (Bacterial Physiology)**
   Learning will be evaluated based on the following criteria:

500 points (5 exams × 100 points each)
250 points (5 written assignments × 50 points each)
+50 points (extra credit, optional)
200 points (summary paper)
950 points total

Final grades will be based on the following performance standard:

95 - 100 % = A
90 - 94 % = A-
87 - 89 % = B+
84 - 86 % = B
80 - 83 % = B-
77 - 79 % = C+
74 - 76 % = C
70 - 73 % = C-
60 - 69 % = D
Less than 60 % = E

2. **MCB4403 (Prokaryotic Cell Structure and Function)**

Learning will be evaluated based on the following criteria:

500 points (5 exams × 100 points each)
250 points (5 written assignments × 50 points each)
+50 points (extra credit, optional)
750 points total

Final grades will be based on the following performance standard:

95 - 100 % = A
90 - 94 % = A-
87 - 89 % = B+
84 - 86 % = B
80 - 83 % = B-
77 - 79 % = C+
74 - 76 % = C
70 - 73 % = C-
60 - 69 % = D
Less than 60 % = E

A. **Exams and assignments for (1) graduate (MCB6937) and (2) undergraduate (MCB4403) students** will complete the following assignments and exams:

Exams (5 exams × 100 points each): Five equally weighted exams are scheduled throughout the semester (see course schedule for details on exam times). Each exam is worth 100 points. The exams will focus on the material covered in the class lectures (online). The student should read the textbook chapters noted in parenthesis and print out the lecture notes (in pdf format, online) and then watch the online lectures to enhance understanding of the material. **The exams are multiple choice/short answer and will be administered on Canvas e-learning through Proctor U services (http://www.proctoru.com/index.php).** ProctorU allows you to take your exam on demand or by appointment. All appointments should be made at least 3 days in advance. To make an appointment, create an account at http://go.proctoru.com, then log in, click on the "new exam" link and select the exam, date, and time you desire. You will receive a confirmation email of your reservation at the email address that you provided to ProctorU. Reservations made within 72 hours of your exam are subject to a $5 late reservation fee. Students without an appointment can take their exam on demand within 15, 30 or 45 minutes utilizing "Take it Now." This premiere feature is designed to give test takers added convenience and only costs $8.75. Late registrations and "Take it Now" are subject to availability.

Written assignments (5 x 50 points each): Written assignments related to lecture material are due throughout the semester (see course schedule). For each assignment:

- Choose only one article per assignment for 700-word summary
- All of the assigned literature is available (free of charge) online through Medline or the UF library at *http://www.uflib.ufl.edu.*
- Read the assigned research article/review.
- Write a brief summary **(~700 words**) of the article.
- Do not plagiarize (http://web.uflib.ufl.edu/msl/07b/studentplagiarism.html).
- Upload the assignment onto Canvas by no later than 11:59 PM on the date of the deadline. Deadlines are in the "COURSE SCHEDULE."
- Use one of the following formats only: Word, PDF, or plain text.

For all written assignments, please use the following reference format or similar:
Article in a periodical: Needham BD, Trent MS. Fortifying the barrier: the impact of lipid A remodelling on bacterial pathogenesis. Nat Rev Microbiol. 2013;11(7):467–81.
Article in a book: King, S.M. (2003). Dynein motors: Structure, mechanochemistry and regulation. In Molecular Motors, M. Schliwa, ed. (Weinheim, Germany: Wiley-VCH Verlag GmbH), pp. 45–78.
Endnote Web (provided by UF) and other library management software can be used to help with this
http://web.uflib.ufl.edu/endnoteweb.html

Assignment 1
a) Kuhlmann, Nathan J., and Peter Chien. "Selective adaptor dependent protein degradation in bacteria." Current Opinion in Microbiology 36 (2017): 118-127.
b) Cianfanelli, Francesca R., Laura Monlezun, and Sarah J. Coulthurst. "Aim, load, fire: the type VI secretion system, a bacterial nanoweapon." Trends in microbiology 24, no. 1 (2016): 51-62.

Assignment 2
a) López-García P, Zivanovic Y, Deschamps P, Moreira D. Bacterial gene import and mesophilic adaptation in archaea. Nat Rev Microbiol. 2015 Jul;13(7):447-56. doi: 10.1038/nrmicro3485. Epub 2015 Jun 15. PubMed PMID: 26075362; PubMed Central PMCID: PMC4601535.
b) Eswara, Prahathees, and Kumaran S. Ramamurthi. "Bacterial Cell Division: Non-Models Poised to Take the Spotlight." Annual Review of Microbiology 71, no. 1 (2017).

Assignment 3
a) Claassens, Nico J., Diana Z. Sousa, Vitor AP Martins dos Santos, Willem M. de Vos, and John van der Oost. "Harnessing the power of microbial autotrophy." Nature Reviews Microbiology 14, no. 11 (2016): 692-706.

b) Carabetta VJ, Cristea IM. The regulation, function, and detection of protein acetylation in bacteria. Journal of Bacteriology. 2017 Apr 24:JB-00107.

Assignment 4
a) Xue J, Yu Y, Bai Y, Wang L, Wu Y. Marine Oil-Degrading Microorganisms and Biodegradation Process of Petroleum Hydrocarbon in Marine Environments: A Review. Curr Microbiol. 2015 Aug;71(2):220-8. doi: 10.1007/s00284-015-0825-7. Epub 2015 Apr 28. Review. PubMed PMID: 25917503.
b) Espaillat, Akbar, Oskar Forsmo, Khouzaima El Biari, Rafael Björk, Bruno Lemaitre, Johan Trygg, Miguel A. De Pedro, and Felipe Cava. "Chemometric analysis of bacterial peptidoglycan reveals atypical modifications that empower the cell wall against predatory enzymes and fly innate immunity." J. Am. Chem. Soc 138, no. 29 (2016): 9193-9204.

Assignment 5
a) Olive, Andrew J., and Christopher M. Sassetti. "Metabolic crosstalk between host and pathogen: sensing, adapting and competing." Nature reviews Microbiology 14, no. 4 (2016): 221-235.
b) Papenfort, Kai, and Bonnie L. Bassler. "Quorum sensing signal-response systems in Gram-negative bacteria." Nature reviews. Microbiology 14, no. 9 (2016): 576-588.

Extra Credit (50 points, optional): Please provide a comprehensive 1000-word summary that includes a brief discussion of your opinion based **on all of the following** articles listed:

1. Tran, Truc T., William R. Miller, Yousif Shamoo, and Cesar A. Arias. "Targeting cell membrane adaptation as a novel antimicrobial strategy." Current opinion in microbiology 33 (2016): 91-96.
2. Yang, Qiu E., and Timothy R. Walsh. "Toxin–antitoxin systems and their role in disseminating and maintaining antimicrobial resistance." FEMS Microbiology Reviews 41, no. 3 (2017): 343-353.
3. Wittekind, Michael, and Raymond Schuch. "Cell wall hydrolases and antibiotics: exploiting synergy to create efficacious new antimicrobial treatments." Current opinion in microbiology 33 (2016): 18-24.
4. Holmes, Alison H., Luke SP Moore, Arnfinn Sundsfjord, Martin Steinbakk, Sadie Regmi, Abhilasha Karkey, Philippe J. Guerin, and Laura JV Piddock. "Understanding the mechanisms and drivers of antimicrobial resistance." The Lancet 387, no. 10014 (2016): 176-187. **Only the following subsection: *Emergence of resistance***

B. Only graduate (MCB6937) students are to complete the following assignment:

Summary Paper: The summary paper should be an overview of a topic related to prokaryotic biochemistry, metabolism or cell physiology of interest to you. The paper must be typed (double-spaced with 1-inch margins). The summary paper should include 10 pages. References, a title page, and figures/tables can be included on extra pages. While the figures and tables are optional, they might be helpful in presentation. The aim of this paper is to provide a summary or a review of peer-reviewed **research** articles published in scientific journals. Although the deadline for choosing a subject of this paper is 10/31, please contact me early in the semester to discuss the topic of your summary paper (including potential references you will use for the final paper) to confirm that your topic is relevant to the subject area. Please upload the paper through Canvas e-learning by no later than **DECEMBER 07, 2017.** This paper will be scanned by TurnItIn for plagiarism. Contact me if you have doubts what constitutes plagiarism.

COURSE SCHEDULE:

Week 1		
	T 08/22	**Introduction to course and overview of the syllabus MEET IN CLASS** (recording will be available for online students one day later)
	R 08/24	Structure and Function (Chapter 1)
Week 2		
	T 08/29	Structure and Function (Chapter 1) continue
	R 08/31	Growth and Cell Division. Chromosome Replication (Ch 2-3)
Week 3		
	T 09/05	**Catch up (Ch 1-4). MEET IN CLASS** (recording will be available for online students one day later) Assignment 1 – due
	R 09/07	Membrane Bioenergetics (Chapter 4)
Week 4		
	T 09/12	Electron Transport, Photosynthesis (Chapters 5-6);
	R 09/14	**Catch up (Chapters 4-6) MEET IN CLASS** (recording will be available for online students one day later)
Week 5		
	T 09/19	**Exam 1 (Chapters 1-6) ProctorU**
	R 09/21	Regulation of Metabolic Pathways (Chapter 7)
Week 6		
	T 09/26	Central Metabolic Pathways (Chapter 8-9) Assignment 2 – due
	R 09/28	**Catch up (Chapters 7-9). MEET IN CLASS** (recording will be available for online students one day later)
Week 7		
	T 10/03	**Exam 2 (Chapters 7-9) ProctorU**
	R 10/05	Metabolism of Lipids, Nucleotides, Amino Acids and Hydrocarbons (Chapter 10)
Week 8		
	T 10/10	Cell Wall and Capsule Biosynthesis (Chapter 12)
	R 10/12	**Catch up (Ch 10-13) MEET IN CLASS** (recording will be available for online students one day later)
Week 9		
	T 10/17	Inorganic Metabolism (Chapter 13) Assignment 3 – due
	R 10/19	**Exam 3 (Chapters 10, 12-13) ProctorU**
Week 10		
	T 10/24	Metabolism (Ch. 14)
	R 10/26	Fermentations (Ch. 15)
Week 11		
	T 10/31	Assignment 4 – due **Graduate students: Summary paper subject due**
	R 11/02	**Catch up (Ch 14 and 15) MEET IN CLASS** (recording will be available for online students one day later)
Week 12		
	T 11/07	**Exam 4 (Chapters 14-15) ProctorU**
	R 11/09	Solute Transport. Protein Transport and Secretion (Chapters 17-18)
Week 13		
	T 11/14	Assignment 5 – due
	R 11/16	Responses to Environmental Stress. Responses to environmental Cues. Chemotaxis (Ch. 16, Ch. 19 and Ch. 20)
Week 14	T 11/21	**Catch up (Chapters 16, 19, 20) MEET IN CLASS** (recording will be available for online students one day later)
	R 11/23	**Thanksgiving**
Week 15		
	T 11/28	**Exam 5 (Chapters 16, 19-20) ProctorU**
	R 11/30	**Meet with instructor by appointment to review material if needed**
Week 16	T 12/05	Extra Credit Assignment – due (optional)
	R 12/07	**Summary paper due (graduate students only)** **Cumulative Final Exam (optional) ProctorU**

OTHER INFORMATION:

Attendance and Make-Up Work

Excused absences follow the criteria of the UF Undergraduate Catalogue (e.g., illness, serious family emergency, military obligations, religious holidays) and must be communicated by formal signed documentation to the instructor **prior to the missed exam**. Appropriate documentation MUST be provided for the absence caused by serious illness, accident, jury duty or death in the immediate family. An alternative time for the exam will be arranged by the instructor. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

COURSE MATERIALS: PLEASE NOTE THAT THE COURSE INSTUCTOR CONSIDERS ALL UNAUTHORIZED ONLINE POSTING OR DISTRIBUTION OF COURSE MATERIALS A FORM OF ACADEMIC DISHONESTY, AND SUCH ACTIONS WILL BE TREATED ACCORDINGLY. All course materials posted on the course website are assembled and intended for students taking this course ONLY, this is why they are only available for student use from the secure Canvas website. Unauthorized posting of course materials infringes on UF's copyright policies and the "Fair Use" Act. These policies will be vigorously upheld at all times in this course.

Online Course Evaluation Process

Student assessment of instruction helps to improve teaching and learning. Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Academic Honesty

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 honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*."

It is assumed that you will complete all work independently unless the instructor provides explicit permission for you to collaborate on course tasks. Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

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.

Services for Students with Disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester

Campus Helping 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: *http://www.counseling.ufl.edu/cwc/Default.aspx*, 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, 392-1111 (or 9-1-1 for emergencies). http://www.police.ufl.edu/

Academic Resources

- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learningsupport@ufl.edu. https://lss.at.ufl.edu/help.shtml.
- Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://www.crc.ufl.edu/
- Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance concerning using the libraries or finding resources.

Online Course Assistance

- Each online distance learning program has a process for and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See http://distance.ufl.edu/student-complaints

University of Florida
Department of Microbiology and Cell Science

IMMUNOLOGY
PCB 5235 (3 credits)

SPRING SEMESTER 2021

COURSE DESCRIPTION:

PCB 5235 is a comprehensive course in basic immunology designed for graduate students. Emphasis will be placed on fundamental aspects of immunology, and its application to real-world immunological research and concerns. Upon successful completion of the course, students will have a solid immunological information foundation suitable for future educational endeavors in the areas of biomedical research, or human/veterinary clinical applications. In addition, students will have a fundamental understanding of basic immunological experimental design. Student assessments in PCB 5235 will focus heavily on immunological facts, concepts, and problem solving based on the application of concepts. PCB 5235 will be co-taught with PCB 4233.

Prerequisite: MCB 3023 or equivalent. Students lacking prerequisite should consult the instructor prior to enrolling in this course.

INSTRUCTOR & OFFICE HOURS:
Dr. Joseph Larkin III
MCS Building, Room 1253 (all office hours by Zoom)
Phone: 352-392-6884
Skype: joseph.larkin.3rd
Mondays and Tuesdays 2:45-3:45
(Note: Students unable to meet these hours may schedule appointments: email jlarkin3@ufl.edu. I will not be available for scheduled appointments on Jan 26th, Feb 16th, or April 20th)

TAs:

Joseph Chomiak- jchomiak@ufl.edu
Kori Spiropoulous - kori.spiropoulos@ufl.edu
Jatin Sharma- jatin.sharma@ufl.edu

Phone: 352-392-9676

WEB PAGE:
E-learning (Canvas)

LECTURES: Monday, Wednesday, and Friday (4th period) 10:40-11:30 Little Hall 101 or Zoom.

Zoom lectures will be recorded and available asynchronously accessed on canvas.

MATERIALS:

COURSE REQUIREMENT:

LaunchPad for Owen, Punt, Stranford. 2019, *Kuby Immunology*, Eight Edition. Macmillan Learning, New York.

Please access materials through All Access connected to Immunology Canvas Website

Please note the website below. Many animations used in class can be found on this website.
http://www.youtube.com/user/garlandscience

OUTSIDE ASSIGNED READINGS: The following journal articles will supplement class lectures and are available on class website:

Josefowicz SZ, Rudensky A. Control of regulatory T cell lineage commitment and maintenance. Immunity 2009; **30**: 616-625.

Izcue A, Coombes JL, Powrie F. Regulatory T cells and intestinal inflammation. Ann Rev Immunol 2009; **27**: 313-338.

Sokol CL, et al. Basophils function as antigen presenting cells for an allergen-induced T helper type 2 response. Nat Immunol 2009; **10**: 713-720.

Tussiwand R, et al. Tolerance checkpoints in B cell development: Johnny B good. Eur J Immunol 2009; **39**: 2317-2324.

Allers K, et al. Evidence for the cure of HIV infection by CCR5{delta}32/{delta} 32 stem cell transplantation. Blood 2010; doi:10.1182/blood-2010-09-309591.

Raison CL, et al. Inflammation, Sanitation, and Consternation. Arch Gen Psychiatry 2010; 67(12):1211-1224.

PUNCTUALITY: Class will begin promptly at 10:40 a.m. Please be on time and seated, with your cell phone turned off. Should you arrive late to class, please use the doors located at the rear of the room.

STUDENT LEARNING OUTCOMES: Upon successful completion students will -

- Be able to clearly state the role of the immune system
- Be able to compare and contrast the innate versus adaptive immune systems.
- Be able to articulate the roles of Toll-Like Receptors in the innate and adaptive immune responses and specifically identify select receptors.
- Be able to compare and contrast humoral versus cell-mediated immune responses.
- Be able to distinguish various cell types involved in immune responses and associated functions
- Be able to distinguish and characterize CD4+ T helper cell lineages TH1, TH2, TH17, and regulatory T cell (Treg).
- Be able to distinguish and characterize antibody isotypes, development, and functions.
- Understand the role of cytokines in immunity and immune cell activation; and be able to identify and characterize cytokines of particular immune importance.
- Understand the significance of the Major Histocompatibility Complex in terms of immune response and transplantation.
- Be able to describe lymphocyte development and the expression of antigen receptors.
- Be able to characterize processes utilized by the immune system to mediate tolerance to self-tissues
- Understand current scientific knowledge related to autoimmune disease etiologies
- Be able to articulate the ramifications of immunodeficiency with particular emphasis on acquired immunodeficiency.

STUDENT EVALUATION:

Class Attendance

We will be utilizing the Hy-Flex method of teaching this semester. Lectures will be available Live-Brick (Little Hall 101) and Mortar, Live-Zoom (available through Canvas), and asynchronous recorded Zoom Lectures. Remaining current in the class is strongly encouraged

CT- No physical class (camtasia or pre-recorded lecture)

Students are expected to read the Chapter in Kuby Immunology corresponding to lecture *prior* to the lecture. Students attending live lectures will at random be asked to participate in discussions pertaining to prior readings, lectures, and online Assignments.

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/.

Online Assignments/"Quizzes"

Open book Assignments "Quizzes" are located within the quiz section eLearning. No Proctoring will be involved in the completion of open book assignments. You will have 10 assignments to complete.

Each one is worth 5 points for a total of 50 points. The due dates are listed below.

Assignment 1 - Section 1	Tuesday	1/19/21
Assignment 2 - Section 2	Tuesday	1/19/21
Assignment 3 - Sections 3&4	Tuesday	2/02/21
Assignment 4 - Sections 4&5	Tuesday	2/09/21
Assignment 5 - Section 6	Tuesday	2/23/21
Assignment 6 - Section 7	Tuesday	3/02/21
Assignment 7 - Section 8	Tuesday	3/09/21
Assignment 8 - Sections 9&10	Tuesday	3/23/21
Assignment 9 - Section 11	Tuesday	4/01/21
Assignment 10 - Sections 12&13	Tuesday	4/06/21

Pretest

A pretest will be assigned at the beginning of the course to serve as a diagnostic test. It will not negatively contribute to your grade and is purely for diagnostic purposes. Completion will result in 10 points."

Discussions

Peer to Peer interactions play an important role in the learning process. To facilitate these interactions, **8 discussions will be assigned**. Discussion entries will be due at 11:59pm of the dates listed below. Four of these discussions (starred) will involve the generation of a practice exam. Significantly, some questions posted on the discussion board will likely be used on the exams. Therefore, it is to the advantage of all students to review the questions posted on the student designed study guides.

Discussion #1	Thursday 1/14/21
Discussion #2 (*)	Thursday 1/21/21
Discussion #3	Thursday 2/04/21
Discussion #4 (*)	Thursday 2/13/21
Discussion #5	Thursday 2/25/21
Discussion #6 (*)	Thursday 3/04//21
Discussion #7	Thursday 3/25/21
Discussion #8 (*)	Thursday 4/15/21

Online Projects

Online projects will be based on outside readings, the text, and the lectures. Online assessments will involve experimental design and critical review of journal articles. Online projects will be available on the course website in canvas, with due dates listed below. There will be 4 assignments due at 10pm on their respective due dates. Each Online Project will be worth twenty-five points each for a total of 100 points.

Project 1	Monday 2/01/21
Project 2	Monday 3/01/21
Project 3	Monday 3/22/20
Project 4	Monday 4/19/21

Examinations

Four (4) computer based, fifty minute exams will be administered, consisting of approximately 30 multiple choice-format. The best 3 of the 4 exams will be utilized to calculate class grade (180 points each for a total of 540 points, with the lowest grade excluded from grade calculation.

Although each exam will focus on a particular period of instruction, given the nature of the subject matter, all examinations will be cumulative. Questions will be related to all lectures given in the class, including guest lectures.

Exams will be administered through Honorlock Students may schedule exams times from 6am-11pm on the day of the exam.

Makeup exams will be given only with advanced written permission from the instructor. Only cases of serious illness, bereavement, or activities that fall under the Twelve-Day rule will be considered for makeup. You must provide official documentation for all cases.
A *missed (in semester) exam*, without appropriate instructor approval, *will be considered the lowest exam grade* and excluded from grade calculation.

Please note: Professional Schools **will** reschedule interviews if they conflict with an exam. Take care of conflicts and other problems immediately.

A mandatory cumulative 2hr. final examination (300 points) will be administered. The exam will be available from Wednesday, April 28th at 6pm to Thursday, April 29th at 6pm during final exams week. There is no make up for the final.

Exam Review Policy

Students are permitted to view previous exam results during appointments or office hours. Exam viewings for previous exams are available until the next exam is issued. At that time more distant exams are no longer available

Grading Format:

Pretest		10	points
Assignments	10@5 points each	50	points
Online Projects	4@ 25 points each	100	points
In-Class Exams	3@180 points each	540	points

Final Examination	300	points
Total	**1000**	points

Extra Credit: Discussion points will be added into the course grade for

Discussions	6@5 points each	30	points

Final grades will be based on the following performance standard (1000 points total):

890 - 1030 points	=	**A**
860 - 889 points	=	**A-**
830 - 859 points	=	**B+**
800 - 829 points	=	**B**
770 – 799 points	=	**B-**
730 - 769 points	=	**C+**
670 - 729 points	=	**C**
620 - 699 points	=	**D+**
570 – 620 points	=	**D**
Less than 570 points	=	**E**

For questions regarding University of Florida Grading Policies please consult:

https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Cumulative Final exam: Wednesday, April 28th 6pm – Thursday April 29th 6pm

LECTURE SCHEDULE

Week	Day	Date	Lecture	Topic	PPT
1	M	1/11	1	Class Intro + Overview	1
	W	1/13	2	Historical Development	1
	F	1/15	3	Innate Immunity	2
2	M	1/18		**No Class (MLK Day Observed)**	2
	W	1/20	4	Adaptive Immunity	3
	F	1/22	5	Cells of the Immune System	3
3	M	1/25	6	Cells of the Immune System	**3**
	W	1/27		**Exam 1 – No Class**	
	F	1/29	7	Hematopoiesis	4
4	M	2/1	8	Hematopoiesis	4
	W	2/3	9	Immune System Organs/Lymphatics	5
	F	2/5	10	Immune System Organs/Lymphatics	5
5	M	2/8	11	Lymphatics	5
	W	2/10	12	Adaptive Immune System	**1-5**
	F	2/12	13	T and B lymphocytes	6?
6	M	2/15	14	Immune Dysfunction	6
	W	2/17	15	**Exam 2-No Class**	6
	F	2/19		Receptors, Signaling, Antibodies	7

7	M	2/22	16	Receptors, Signaling, Antibodies	7
	W	2/24	17	Receptors, Signaling, Antibodies	7
	F	2/26	18	Receptors, Signaling, Ab + Cytokines	7
8	M	3/1	19	Cytokines,	8
	W	3/3	20	Cytokines, innate Immunity	8
	F	3/5	21	Innate Immunity	8
9	M	3/8		**Exam 3 – No Class**	
	W	3/10	22	Experimental Systems	9
	F	3/12	23	Experimental Systems	9
10	M	3/15	24	Experimental Systems	9
	W	3/17	25	Guest Lecture: Dr. Hoffman (Complement)	10/11
	F	3/19	26	Guest Lecture: Dr. Hoffman (Complement)	11
11	M	3/22	28	Larkin Complement Review	11
	W	3/24	29	Ig Organization and Expression	11
	F	3/26	30	Ig Organization and Expression	11
12	M	3/29	31	Ig Organization and Expression	11
	W	3/31		**Exam 4 – No Class**	
	F	4/2	32	Guest Lecture	
13	M	4/5	33	Guest Lecture	
	W	4/7	34	Guest Lecture	
	F	4/9	35	MHC	12
14	M	4/12	36	MHC	12
	W	4/14	37	MHC	12
	F	4/16	38	T Cell Development	13
15	M	4/19	39	T Cell Development	13
	W	4/21	40	Course Wrap-up	14
	F	4/23		Reading Day _No Class	
	W/TH	4/28-4/29		**Cumulative Final exam**	

NOTES: Some components regarding the schedule are subject to change based on how the class is flowing. Exams have been set on the aforementioned dates regardless of content covered; however, exam material will be adjusted to reflect the covered content

Academic Honesty, Software Use, UF Counseling Services, Services for Students with Disabilities

COVID Response Statements

We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms (Click here for guidance from the CDC on symptoms of coronavirus), please use the UF Health screening system and follow the instructions on whether you are able to attend class. Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms.
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. Find more information in the university attendance policies.

Privacy Statement

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices 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 communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

The university's honesty policy regarding cheating, plagiarism, etc.

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. Click here to read the Honor Code. 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.

Campus Resources:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

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

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.

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.

Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

0001 Reid Hall, 392-8565, **www.dso.ufl.edu/drc/**

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0001 Reid Hall, 392-8565, **www.dso.ufl.edu/drc/**

MCB 5205: MICROBIOLOGY OF HUMAN PATHOGENS Fall 2015 section 24H5

Hybrid Course Delivery: Online (Asynchronous lectures; Canvas course website) and **Mondays period 1 (7:25 am – 8:15 am, MCCC 0100; "live" lectures recorded and posted to Mediasite)**

Instructor: Dr. Kelly Rice
Office: Room 1147, Microbiology and Cell Science Bldg.
Ph: 352-392-1192, email: kcrice@ufl.edu ***(**please use this email for all correspondence, as I check this more often than email through the Canvas course website**)***
Office hours: Wednesdays 9:30 am – 11:30 am
**For off-campus students, please arrange office hour appointments by email (kcrice@ufl.edu). Skype or Canvas will be the communication tool for these appointments.

Course Description: Survey of advanced topics and current scientific literature related to human host-pathogen interactions and microbial pathogenesis, focusing on emerging bacterial and viral pathogens as agents of human disease, biosecurity, molecular identification methods, spread of multi-drug resistance among bacterial pathogens, drug discovery and alternative treatment research.

Course Objectives: At the completion of this course, students should be able to:

1. Recognize the complex nature of microbial virulence, especially with respect to the multi-faceted interplay between the host immune system and pathogen
2. Describe (using specific examples) the strategies used by bacterial and viral pathogens that are required for host manifestation of disease (attachment and entry into host tissues, evasion of host immune defenses, multiplication in vivo, dissemination and transmission)
3. Identify strategies of treatment and prevention of host infection (ie. vaccines, antibiotics, antivirals, protective role of normal microbiota) and the ensuing response of the pathogen
4. Analyze hypothetical medical case studies using the knowledge gained from objectives 1-3 above.
5. Relate objectives 1-3 above to contemporary research literature in the field of microbial pathogenesis
6. Research, design and create a comprehensive recorded lecture outlining the history, pathogenesis, current treatment strategies, and unanswered questions of a historic, emerging or re-emerging pathogen.

Required Textbook:
1. Wilson et al. Principles of Bacterial Pathogenesis, A Molecular Approach (3rd Edition), ISBN 978-1-55581-418-2

Optional/Recommended Textbook:
1. Jawetz et al. Medical Microbiology, 26th Edition, ISBN 978-0-07179-031-4 (**eBook* available through UF libraries**: http://uf.catalog.fcla.edu/uf.jsp?st=UF031735546&ix=pm&I=0&V=D&pm=1
**Please note that you MUST be logged on to UF library website or Gatorlink VPN to access this eBook off-campus)*

Bibliography of Assigned Readings and Presentations (available online or through UF libraries):
an online synchronous discussion group for each of these readings/presentations will be scheduled before each exam throughout the semester

1. Gibson, G. (2011), "Probiotics and prebiotics", in Finlay, B. (ed.), Microbiota: Agents for Health and Disease, The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London (online at http://hstalks.com/bio) (**EXAM 1**)
2. Daniel J. Hassett, Mark D. Sutton, Michael J. Schurr, Andrew B. Herr, Charles C. Caldwell, Joseph O. Matu. (2009), *Pseudomonas aeruginosa* hypoxic or anaerobic biofilm infections within cystic fibrosis airways, Trends in Microbiology, 17: 130-138, doi: 10.1016/j.tim.2008.12.003. (**EXAM 2**)
3. Walker, B. (2007), "How HIV Causes Disease", in Gallo, R. (ed.), Retroviruses: Biology, Pathogenic Mechanisms and Treatment, The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London (online at http://hstalks.com/?t=BL0401757) (**EXAM 3)**
4. Schultz, G. (2014), "Biofilms and chronic wounds: winning the war in wounds", in Schultz, G. (ed.), *Wound Healing*, The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London (online at http://hstalks.com/?t=BL1863835) (**EXAM 4**)

Overview of Course Format:

- MCB5205 is co-taught with the undergraduate course MCB4203 (Bacterial and Viral Pathogens). In addition to the lecture material and exams that are shared with MCB4203, **students enrolled in MCB5205 are required to complete the following: (1) 10% of each proctored exam 1-4 will be drawn from a pool of questions specifically associated with an additional series of four assigned readings/presentations (see Bibliography above); (2) Research and prepare a recorded online lecture (see below for more details).**

- **Email will be primary mode of course correspondence**. Each student is responsible for checking their "**ufl.edu**" email accounts and Canvas for course messages and announcements.

- Course syllabus, lecture notes, and other tools will be available through the Canvas Learning Support System homepage [http://lss.at.ufl.edu/]. You will need to enter your Gatorlink username and password to access the system. If you do not have an active GatorLink ID, cannot remember your GatorLink login information, or if your ID does not work, please refer to the GatorLink website [http://gatorlink.ufl.edu] or to the UF Computing Help Desk (The Hub, 392-HELP) for assistance.

- All weekly course lectures (pre-recorded), modules, and assignments will be posted on the Canvas course website. Additionally, in-class weekly review sessions (attendance is optional but encouraged) will be held on **Mondays during period 1 (MCCC 0100)**. These live review sessions will be recorded by Mediasite and will be accessible through Canvas. Questions regarding lecture and other online material should be addressed during weekly review sessions or during office hours. Additionally, you are highly encouraged to participate in the Canvas course chat room and discussion boards that will be scheduled periodically throughout the semester. The course instructor will not be able to answer emails related to course content or study questions the night before a scheduled exam, so please make sure to take advantage of all the options mentioned above.

- ***A note regarding course materials and copyright*:** All course materials posted on the Canvas course website are assembled and intended for students taking MCB4203/MCB5205 ONLY, and this is why they are only available for student use from our secure Canvas course website. Currently, the format is such that you may download most course materials (lectures, notes, etc) from Canvas for "offline" study purposes while you are enrolled in the course. However, re-posting of any of these materials to websites such as "course-hero", You Tube, or Facebook is strictly forbidden by the course instructor and is considered a violation of copyright policies. If such "re-posting" is found to occur, lecture videos will no longer be available in a downloadable format. Likewise, re-posting textbook pdfs is an infringement on the publisher's copyright, so please do not get yourself in trouble by doing this. Unauthorized re-posting of all course materials (including textbook pdfs) infringes on UF's copyright policies and the "Fair Use" Act (http://www.generalcounsel.ufl.edu/faq/Copyright.pdf).

- **Weekly "homework":** There will be 15 weekly online quizzes or mini-assignments, based on the weekly lecture material, posted readings and/or case-studies. Each quiz is worth 10 points and will typically consist of 5 multiple-choice questions OR 1-2 short answer (1 paragraph) essay-style questions. ***At the end of semester your lowest 5 quiz scores will be dropped from your grade calculation. In other words, the top 10 quiz scores will be used in calculating your grade (10 x 10 points = 100 total points).*** These are open-book quizzes (administered through Canvas) that are meant to help you review the course material and practice for the exams. Students are welcome to study together and in fact collaboration is encouraged on many assignments. However, each student is responsible for submitting his/her own quiz by the posted due date.
  - IF A STUDENT FAILS TO COMPLETE A QUIZ PRIOR TO THE DUE DATE, THEY WILL RECEIVE 0 POINTS FOR THAT ASSIGNMENT OR QUIZ. EXTENSIONS OR "MAKE-UP" QUIZZES WILL NOT BE GIVEN UNDER ANY CIRCUMSTANCE, WITH THE EXCEPTION OF PROOF OF TECHNICAL DIFFICULTY (see below) THAT PRECLUDES ON-TIME SUBMISSION. The structure of the final course grade calculation with respect to the quizzes (dropping the 5 lowest quiz scores) is designed to give you a "buffer" for those rare occasions where a quiz cannot be completed due to illness, absence, or random forgetfulness. Therefore please do not ask the instructor to accept late quizzes or re-open quizzes, the answer will always be "no"…
  - 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 capturing 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.

- **Presentation:** Each student enrolled in MCB5205 will be responsible for choosing a historic, emerging, or re-emerging pathogen (bacterial or viral) of interest, and will research and preparing a recorded online lecture (to be submitted through Canvas course website) outlining the history, pathogenesis (both host and pathogen aspects), current treatment strategies (if any), and

unanswered questions in the field of study. 15 multiple-choice questions will also be submitted with the recorded lecture, and the instructor will choose questions from these that will appear on MCB4203 Exam 4. This presentation will be due towards the end of the semester (to be announced).

- **Reference Letter Policy:** Academic reference letters may be provided at the instructor's discretion to students ranking in the top 20% of the final course grades. Please keep in mind that these letters will be strictly academic letters (i.e. your scholastic abilities and participation in the course) and will not elaborate on other things like personal attributes, leadership and research potential, since these are qualities that are very difficult for the instructor to assess in a large-class environment. For more tips on reference letters please refer to the first lecture of the semester (Monday Aug 24th "live"/mediasite lecture). Letters must be requested no later than 6 months after the end of the course.

- **Online Course Evaluation Process:** Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.

  - Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See http://distance.ufl.edu/student-complaints for more details.

Overview of Exam Testing:

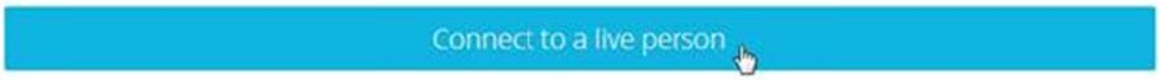
- All exams for this course will be administered through Canvas and students will take them online through ProctorU.

  - In order to maintain a high standard of academic integrity and assure that the value of your University of Florida degree is not compromised, course exams are proctored online by ProctorU. You will take your exam electronically using the Canvas course website, but you will register with ProctorU early in the semester, and then sign up for a time for a certified proctor in a testing facility to observe you on your computer while you take your exam. You need a webcam, speakers, microphone and reliable Internet connection to be able to take your exams. **Wireless Internet connections have been found to cause issues with online exams and it is therefore strongly recommended to NOT use a wireless Internet connection when taking an online, proctored exam**. **You will also need a mirror or other reflective surface.**

  - Sign up for an account with ProctorU during the first week of the semester. If you already have a ProctorU account, you can use the same account. Register with ProctorU for your exam appointment times early in the semester. You must sign up at least **72 hours** before an exam. Failure to do so will result in additional fees and reduce the likelihood that the time you want will be available. You should receive a confirmation email from ProctorU. If you experience any trouble with online registration, you can call **855-772-8678**.

- Prior to each exam, go to the ProctorU Test Page to ensure your computer is ready for online proctoring. After you get the following 6 checks that your system is ready:

Take the extra step to connect to a live person:



- This process takes just a few minutes and is completely free.

- If you are unable to take an exam because of a technical glitch on your end, that is your responsibility. However, if you do experience technical difficulties during the exam, ProctorU will document those difficulties and communicate with your instructor to make alternative arrangements.

- ***For additional questions, please review the Proctored Exams Student Handout (available under "General Course Resources" Module on Canvas course website).***

- The window for completing each exam will begin at 6 AM on each scheduled exam day (Wednesday) and last through 6 AM on the Friday (Total window for each exam = 2.0 days).

- Although each exam is designed to be completed in 50 minutes or less, **the time-limit on each ProctorU exam will be set at 75 minutes.**

- **Make sure you sign-up for the correct exam course number – MCB5205 + your section number (24H5).**

- Exams are closed-book. Materials such as cell phones, scratch paper, books, notes, calculators, etc. will NOT be allowed during the exam and should not be readily accessible.

- **MAKE-UP EXAMS:** If a student has a legitimate reason for missing an exam, the exam can be made-up at an alternative time as arranged with the course instructor. Documentation supporting the inability to write the exam within the scheduled exam window may be requested by the course instructor. Excused absences follow UF criteria (e.g., illness, serious family emergency, military obligations, religious holidays), and should be communicated to the instructor prior to the missed exam whenever possible.

GRADES - The grading scheme for this course is as follows:

Weekly "homework" - 10 points each (100 points total)
EXAMS 1-4: 100 points each (400 points total)
Presentation: 100 points

TOTAL POINTS = 600

Final letter grades will be assigned based on the number of points earned, as follows:

A = 552-600 points	C+ = 462-479.9 points	E = 0-359.9 points
A- = 534 – 551.9 points	C = 438-461.9 points	
B+ = 522 – 533.9 points	C- = 420-437.9 points	
B = 504 – 521.9 points	D+ = 390-419.9 points	
B- = 480-503.9 points	D = 360-389.9 points	

For information on current UF policies for assigning grade points, see

https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Should you have any complaints with your experience in this course please visit http://www.distance.ufl.edu/student-complaints to submit a complaint.

Academic Honesty, Software Use, Campus Helping Resources, Services for Students with Disabilities

Academic Honesty:
In 1995 the UF student body enacted an honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

The Honor Pledge:
We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean, Student Honor Council, or Student Conduct and Conflict Resolution in the Dean of Students Office. *(Source: 2012-2013 Undergraduate Catalog)*

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor.

These policies will be vigorously upheld at all times in this course.

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.

Campus Helping Resources:
Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.
 University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,
www.counseling.ufl.edu/cwc/

Counseling Services Self-Help Library
Groups and Workshops Training Programs
Outreach and Consultation Community Provider Database
 Career Resource Center, First Floor JWRU, 392-1601, **www.crc.ufl.edu/**

Services for Students with Disabilities
The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. 0001 Reid Hall, 352-392-8565, **www.dso.ufl.edu/drc**

TENTATIVE SCHEDULE OF WEEKLY LECTURE TOPICS:

WK	TOPIC(S)	TEXTBOOK CHAPTERS
1	Introduction to Course, Koch's Postulates, Barry Marshall guest lecture (*Helicobacter pylori part 1)*	Wilson Ch. 6
2	First Lines of Host Defense (*Helicobacter pylori part 2)*	Wilson Ch. 2
3	Normal Flora/Quantitative and Qualitative Microbial Census *("microbial shift disease")*	Wilson Ch. 5
4	Innate and Adaptive Host Immunity	Jawetz Ch. 8
	EXAM 1 WINDOW: WED. SEPT. 23 @ 6 AM – FRI. SEPT. 25 @ 6 AM.	**Weeks 1-4**
5	Measuring Infectivity and Virulence	Wilson Ch. 8
6	Identification of Bacterial Virulence Factors (bacterial and host approaches)	Wilson Ch. 9-10
7	Bacterial Evasion of Host Defenses (*Listeria monocytogenes*, *Streptococcus pyogenes*)	Wilson Ch. 11
8	Bacterial Toxins (*Corynebacterium diphtheriae*, *Clostridium botulinum*)	Wilson Ch. 12
	EXAM 2 WINDOW: WED. OCT. 21 @ 6 AM – FRI. OCT 23 @ 6 AM.	**Weeks 5-8**
9	Introduction to Viruses, Human Cancer Viruses	Jawetz Ch. 29-30, 43
10	Influenza, Smallpox Virus, Vaccine controversies	Jawetz Ch. 34, 39, & TBA reading
11	Measles, Mumps, Rubella	Jawetz Ch. 40
12	Ebola, "Two Favorite viral diseases" (student-voted topics)	TBA
	EXAM 3 WINDOW: WED. NOV. 18. @ 6 AM – FRI. NOV. 20 @ 6 AM.	**Weeks 9-12**
13	Antibiotics: Modes of Action and Bacterial Resistance (*MRSA "superbug"*)	Wilson Ch. 15 and 16
14	Biosecurity (*Bacillus anthracis*, *Yersinia pestis*)	Wilson Ch. 20
15	Opportunistic Infections (*Clostridium difficile*, *Pseudomonas aeruginosa*,	Wilson Ch. 18-19

	Acinetobacter baumannii, E. coli)	
16	“Two Favorite bacterial diseases” (student-voted topics)	TBA
	<u>EXAM 4 WINDOW</u>: DURING WEEK 16 or FINALS WEEK (to be voted on by students)	**Weeks 13-16**

Prokaryotic Diversity — MCB 4150/6151 — Summer C 2021
Course Syllabus

Instructor

Dr. Brent C. Christner (xner@ufl.edu), Microbiology and Cell Science, MCB 1252, (352) 392-1179

Office hours

By appointment and via Zoom

Preferred method for communication with the instructor

Email with the subject "MCB 4150" (undergraduate students) or "MCB 6151" (graduate students)

Delivery method

Online

Credits and prerequisites

Three. Undergraduates require MCB 3020 or MCB 3023 with minimum grades of C.

Course description

This course is an introduction to the diversity of the *Bacteria* and *Archaea*. Content will provide a conceptual and historical framework for understanding their 1) origin and evolution; 2) morphological, metabolic, and molecular characteristics; 3) genetic and physiological diversity; 4) importance in human/animal/plant health; and 5) roles in elemental cycling.

Course objectives/goals/learning outcomes

The specific objectives of this course are to expose students to the following topics:

- Origin, evolution, and genetic diversity of microbial life;
- Physiological diversity of metabolic and bioenergetic pathways;
- Microbial species and speciation;
- Phylogenetic and functional analysis of (meta)genomic data;
- Characterization of uncultivated microbial lineages; and
- Linkage between microbial diversity, function, and ecology.

Course material and assignments

Assignments: Instructions for and submission of assignments will be through Canvas (http://elearning.ufl.edu/)

Exams: There will be 2 exams and a cumulative final exam. Undergraduate exams will consist of multiple choice questions. Graduate exams will consist of multiple choice (40%), short answer (30%), and essay (30%) questions.

Written assignment: All students must submit a critical analysis of a research paper focusing on some aspect of bacterial or archaeal biology. Submit your research topic through Canvas by **16 June**

2021. The paper is due on **19 July 2021** and should be submitted through Canvas. Detailed information on the assignment can be found in the guidelines (undergraduate or graduate students).

Additional requirements for graduate credit (MCB 6151): Graduate student exams will be more rigorous (e.g., 60% short answer and essay questions) and be graded on different standards from those designated for undergraduate students. Graduate students are also required to submit a research paper of at least 5 pages in length. The paper should focus on a specific topic in prokaryotic diversity (more detail is provided in the assignment guidelines). To obtain a passing grade (i.e., C or higher), graduate students must accrue at least 73% of the possible points in the course.

Participation: Students are expected to participate in the online discussions.

Recommended textbook and research articles

Readings will be assigned from *Brock Biology of Microorganisms* (BBOM; Madigan, M.T., K.S. Bender, D.H. Buckley, W.M. Sattley, and D.A. Stahl., Pearson). Any of the following BBOM editions are acceptable for this course: 16th, 15th or 14th.

There are also supplemental readings of scientific research articles for certain modules that will be available for download from Canvas. Scientific research papers will be assigned and discussed in this course. These materials will be made available to students through the Canvas e-Learning site (http://elearning.ufl.edu/).

Course topics by module

1. Introduction
2. The early history of microbiology
3. Early perspectives on microbial diversity
4. Molecular microbial diversity
5. Microbial evolution
6. Species and speciation
7. Bioenergetics: unity in diversity
8. Overview of the Bacteria and Archaea
9. Proteobacteria and chemolithotrophy
10. SAR11: a proteobacterial clade that dominates the biosphere
11. Even more about the Proteobacteria!
12. Anoxygenic photosynthetic bacteria
13. Oxygenic photosynthetic bacteria
14. Firmicutes, Actinobacteria, and Tenericutes
15. Bacteroidetes
16. Spirochetes
17. Chlamydiae, Planctomycetes, and Verrucomicrobia
18. Deinococcus - Thermus
19. The bacterial 'Candidate Phyla Radiation' (CPR)
20. Thermophiles and hyperthermophiles
21. Methanogens
22. Haloarchaea

23. TACK superphylum
24. Lokiarchaeota and the Asgard superphylum

Exam administration – Honorlock

The exams are proctored through Honorlock. To prepare for an online exam proctored by Honorlock, read the Student Exam Preparation Information handout. Prior to the exam, make sure that you have the Chrome web browser and the Honorlock Chrome extension installed.

Evaluation of learning/grades

Overall grading percentages:

Exam 1	25%
Exam 2	25%
Final Exam	25%
Written assignment	20%
Participation	5%

Materials and supplies fees

There are no additional fees for this course.

Grading policy

A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D+	67-69%
D	63-66%
D-	60-62%
E	Below 60%

Additional information on grades and grading policies:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Make-up policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/.

Students requiring accommodations

Exams in this course take most students no more than 60 minutes. All students will be given double that amount of time (120 minutes) to complete each exam.

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible and *submit their accommodations to the instructor during the first week of the semester*.

Campus resources

Resources are available on campus for students having personal problems or lacking clear career and academic goals, which interfere with their academic performance. These resources include:

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: http://www.counseling.ufl.edu/cwc/Default.aspx, 392-1575;
- Sexual Assault Recovery Services (SARS) at the Student Health Care Center, 392-1161.
- For emergencies call: University Police Department, 392-1111 (or 9-1-1 for emergencies). http://www.police.ufl.edu/

Academic resources

- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.
- Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://www.crc.ufl.edu/
- Library Support, http://cms.uflib.ufl.edu/ask. 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. http://teachingcenter.ufl.edu/
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. http://writing.ufl.edu/writing-studio/

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. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Class demeanor

Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all. Contact the instructor immediately if you experience any problem which prevents you from performing satisfactorily in this class.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.

https://teach.ufl.edu/wp-content/uploads/2020/04/NetiquetteGuideforOnlineCourses.docx

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 (https://www.dso.ufl.edu/sccr/process/student-conduct-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.

Additional comments regarding academic integrity

Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the window is closed. However, the following are considered academic dishonesty and no student should ever do any of the following:

- Have another person complete an exam in this course.
- Copy another student's exam in this course.
- Collaborate with anyone during an exam in this course.
- Discuss the questions and answers of an exam with other students while the quiz window is still open.
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course.

A research paper *in your own words* is required for partial fulfilment of this course and all of the following are considered plagiarism (from http://www.plagiarism.org):

- Turning in someone else's work as your own.
- Copying words or ideas from someone else without giving credit.
- Failing to put a quotation in quotation marks.
- Giving incorrect information about the source of the information.

- Changing words but copying the sentence structure of a source.
- Copying so many words or phrases from a source that it makes up the majority of your work, whether you give credit or not.

Plagiarized work is easily detected and university regulations on academic misconduct will be strictly enforced.

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.

Microsoft Office 365 software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida complaints policy and student complaint process

Most problems, questions and concerns about the course can be resolved by professionally communicating with the instructor.

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact:

- Residential Course: https://sccr.dso.ufl.edu/.
- Online Course: http://www.distance.ufl.edu/student-complaint-process.

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Hence, over the weekend replies to your inquiries or questions may be delayed.

If a student is lacking professionalism repeatedly, the instructor has the right to file formal complaint against the student through the Dean of Student office.

BSC6459: Fundamentals of Bioinformatics, Fall 2021 (3 credits)

BSC6459 (Section **25H0, and 25H1**) is an introduction to the basic bioinformatics tools used in computational biology for life science research. The course will use web-based resources that analyze gene and protein sequences as pertinent data examples.

Student Learning Outcomes – **After successful completion of this course, students should be able to:**

1) Retrieve information on genes and proteins from biological and genomic databases.
2) Predict genes from DNA sequences.
3) Identify promoters and regulatory elements in DNA sequences
4) Analyze protein sequences
5) Compare protein and DNA sequences
6) Visualize and analyze protein structures
7) Construct and interpret simple phylogenies

Lectures/Computer Lab
Online semi-synchronous course: Each week there is a block of content available with specific due dates. Students may view and submit within that window, however, each module is structured to keep the group advancing together.

Instructor: Dr. Valérie de Crécy-Lagard
TA: Ms. Colbie Reed

WebPage: https://ufl.instructure.com/courses/433992

Contact Information:

- **Email (the most efficient):** Use the Canvas e-mail for instructor and TA in priority. (If you do not have access to e-learning platform and if it is an emergency, use vcrecy@ufl.edu). For resolving technical issues visit the helpdesk website (https://helpdesk.ufl.edu) or call 352-392-4357.
- **Zoom Office hours:**
  - Mondays, 5-6 PM EST (hosted by Dr. de Crecy)
  - Wednesdays, 6-7 PM EST (hosted by Colbie Reed)

  Upon conflicts caused by holidays or cancellations, rescheduling will be announced via the course site on CANVAS; if a student cannot attend the scheduled office hours, students may contact Dr. Valerie de Crecy for arrangements.

Required Textbooks: "Essential bioinformatics" 2006, Authors: Jin Xiong Publisher: Cambridge University Press, ISBN -13:978-0-521-60082-8

Additional book of reference: "Understanding Bioinformatics" 2008 by Marketa Zvelebil and Jeremy O. Baum Publisher: Garland Science, ISBN: 9780815340249

Evaluation of learning

- **Assignments**
  - Each lecture will have linked short assignments **(20%)**. *These are short exercises that apply the material covered in class and encourage you to read the pre-class material for the following week.*
  - Group assignments and discussion **(15%)**. *Weekly group assignments will be given. Examples include: 1) reading and discussing papers from the original literature on a subject related to bioinformatics or on a study that combines bioinformatics with experimental data; 2) Creating a tutorial; 3) Peer reviewing of an activity.*
  - Mini-projects **(10%)**. *These are assignments where students apply learning points from several modules.*
  - Final Project **(10%)**

- **Quizzes and Exams**
  - Quizzes **(20%)**
    Multiple choices or short answer quizzes will be given at the end of each module. The quizzes will be timed and can be taken within a specific window of time.
  - Comprehensive exams **(25%)**
    Three cumulative comprehensive exams will be given in the format of application questions that require the correct use of the various bioinformatics tools covered in class as well as an understanding of the underlying biology.

- **Make-up policy.** For the **general assignments** and the **comprehensive exams**, late assignments will be penalized by deducting 25% of the grade for each day late with a maximum deduction capped at 25% of the grade. No late submissions will be accepted for **quizzes/assessments** but we will drop the lowest score for one conceptual and one practical assessment, so if you cannot avoid missing one deadline for an important reason, this failsafe is built in to the course syllabus.
Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: **https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx**.
- **Grading:** Straight scale, follows the policies described here:
  https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

94.0-100%	A
90.0-93.9%	A-
87.0-89.9%	B+
84.0-86.9%	B
80.0-83.9 %	B-
77.0-79.9%	C+
74.0-76.9%	C
70.0-73.9%	C-
67.0-69.9%	D+
64.0-66.9%	D
60.0-63.9%	D-
<60%	E

The grading scale may be adjusted slightly, based on class performance

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Course organization.

Except for Module 1, the module material of a given week will be made available the Friday of the week before. The assignments will be due on the Monday night of the week after. Due dates might be different for Mini Projects and group assignments. You have two weekends for every module but do not wait for the last weekend to start or you will struggle in the class. Module 1 & 3 are a not on the same schedule as to help with starting the class and getting organized (two weeks are given for these modules).

Module	**Textbook** (EB= Essential Bioinformatics)	**Title**
Module 1 (week 1-2)		
		Getting started
	EB1	Bioinformatics Definition and Overview
	EB2	Databases Definition and Overview
M1 Group Activity and Module Assessments		
Module 2 (week 3)		
	EB3	Information retrieval from databases I
M2 Module Assessments		
M2 group activity and **Mini project 1 due (week 4)**		
Module 3 (week 5)		
	EB3-4	Pairwise alignment overview
	EB3-4	Pairwise alignment, database search
M3 Module Assessments		
M3 Group Activity and **Exam 1 (week 6)**		
Module 4 (week 7)		
	EB5-7	Multiple Sequence Alignments
M4 Group Activity and Module Assessments		
Module 5 (weeks 8-9)		
Week 8		
	EB8&17	DNA Sequence Analysis: Genome browsers
	EB8	DNA Sequence Analysis: Predicting genes in prokaryotes
Week 9		
	EB9	DNA sequence analysis: Identifying eukaryotic genes, examples from plants
	EB8-9	DNA sequence analysis: Predicting promoters and regulatory sites
M5 Module Assessments, **M5 Group Activity** and **Exam 2 (week 10)**		
Module 6 (week 11)		
	EB8-9	Practical DNA Sequence Analysis
	EB8-9	Practical Protein Analysis
M6 Module Assessments **and Mini project 2 due**		
Module 7 (week 12)		
	EB10-11	Phylogeny Basics
M7 Module Assessments		
M7 group activity and **Final project part 1** (**week 13**)		
Module 8 (week 14)		
	EB12-13	Visualizing and Comparing Protein Structures
M8 Group Activity and Module Assessments		
Mini project 3, Final Project part 2, and exam 3 due (week 14)		

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center (https://disability.ufl.edu/get-started/). 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, if not before the semester starts.

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. Guidance on how to give feedback in a professional and respectful

manner is available at https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

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. Go to https://sccr.dso.ufl.edu/process/student-conduct-code/ to review the Code of Conduct. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Plagiarism: Definitions, Course Policies
Students should understand behaviors that constitute plagiarism: that is, the submission of materials by a student that are not, in truth, materials generated/created/completed solely by the student. All materials submitted for a grade in this course are expected to have been initiated and completed in entirety by the student for which it is submitted. This is to be assumed as a requirement unless otherwise noted by the instructor and/or assignment specifications. An example of plagiarism would be the submission of any type of assignment files of another student (with or without their knowledge), or submission of files containing images/text of a website or other publisher that is presented without proper attribution of the material's original authors/creators. Metadata of files suspected of plagiarism will be checked. If file metadata is found to have been erased prior to submission, this constitutes evidence of behaviors that may be considered dishonest or purposefully misleading. It is the student's responsibility to ensure that their computer settings properly apply metadata to generated and edited files; this may be checked by navigating to your computer's control panel and "User Accounts" menu. Caution is advised for students using computers that are not exclusively their own property or are provided through their employment, as these settings may not be edited to reflect the student's identity. In these cases, students are expected to communicate this to their instructors to prevent any confusion. Students suspected of plagiarism or other forms of academic dishonesty will be contacted by the course instructor or teaching assistant addressing the suspected submission materials. Severe perpetrations of academic dishonesty or multiple incidences of mild/moderate academic dishonesty will result in possible disciplinary action pending review by the course instructor. Pending a determination of significant academic dishonesty, this may lead to the initiation of formal review processes for disciplinary action at the university administration level.

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 someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website (https://umatter.ufl.edu) to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website (https://counseling.ufl.edu) or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website (https://shcc.ufl.edu).

University Police Department: Visit UF Police Department website (https://police.ufl.edu) or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website (https://ufhealth.org/emergency-room-trauma-center).

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website (https://gatorwell.ufsa.ufl.edu) or call 352-273-4450.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu. (https://helpdesk.ufl.edu)

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services. (https://career.ufl.edu)

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources. (https://uflib.ufl.edu/find/ask/)

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring. (https://teachingcenter.ufl.edu)

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. (https://writing.ufl.edu/writing-studio/)

On-Line Students Complaints: View the Distance Learning Student Complaint Process https://distance.ufl.edu/getting-help/student-complaint-process/.

University of Florida
Department of Microbiology and Cell Science

Comparative Microbial Genomics

MCB 6318 Section 162B (2 credits)
MCB 6318 Section 069F (2 credits)
Advanced Bioinformatics
MCB4934 Special Topics, Section VDC1 (3 credits)

Spring SEMESTER 2021

COURSE DESCRIPTION: Methods to allow experimental scientists lacking computer programming skills to efficiently use the genomic and post-genomic data that is freely available over the web to predict protein function. Examples will be mainly taken from the field of microbial metabolism and regulation.

PREREQUISITE COURSES: Grade B^+ or higher in BSC6459 OR grade A^-/A in BSC4434c

COURSE INSTRUCTORS & OFFICE HOURS:	Dr. Valerie de Crécy-Lagard Every **Wed 8h30 to 9h30 AM** through the Canvas ZOOM tool

E-mail for appointments: I prefer that you use the email through CANVAS. For emergencies you can email us to vcrecy@ufl.edu

WEB PAGE: https://ufl.instructure.com/courses/417339

COURSE OBJECTIVES:

- The students will be able to perform database search in order to identify genes that are physically linked or that follow specific phylogenetic distribution patterns.
- The students will be able to extract information related to genome wide experimental data (gene or protein expression, phenotype, interaction data) gene or protein expression from databases and use this as building blocks or input for research projects
- The students will be able to use databases to search and identify structural homolog or catalytic domains in proteins to elaborate upon the function of unknown proteins
- The students will be able to use databases that integrate different types of data and use advanced visualization tools.
- The students will apply these methods to current issues in microbial physiology and metabolism.

STUDENT RESPONSIBILITIES: Students are expected to meet the deadlines for their assignments, project updates, peer reviews and final project. No extension for the module assignments will be given without prior approval by the instructor and only for catastrophic events (such as hurricanes). Because of the peer review process and the tight deadline for course grade submission, all deadlines for the Final project (four updates, 3 peer reviews and final submission) will be strictly enforced with NO possibilities of extension.

STUDENT EVALUATION:
Students will be evaluated on the basis of:

Assignments:	35%
Project updates:	15%
Peer Reviews:	15%
Final Project:	35%

Final grades will be based on the following performance standard:

100 - 92 %	=	**A**
< 92 - **88** %	=	A-
< 88 – 85 %	**=**	**B+**
< 85 - 82 %	=	B
< 82 - 78 %	=	**B-**
< 78 - 75 %	=	**C+**
< 75 - 70 %	=	**C**
< 70 - 68 %	=	**C-**
< 68 - 65 %	=	**D+**
< 65 - 60 %	=	**D**
< 60 - 58 %	=	**D-**
Less than 58 %	=	**E**

ASSIGNMENTS: For each module, the student will complete between 4 and 9 assignments. Each assignment is designed to apply the concepts, methods or websites covered during the lectures.

FINAL PROJECT: At the end of the course, the student is required to submit a final project in which the goal is to make a hypothesis of the function of a hypothetical protein/family of proteins by applying the knowledge gained during the course. The student will be given a gene family and using a combination of data-mining, comparative genomic analysis, phylogenomics and protein sequence and structure analysis tools the student will have to present what can be inferred about the protein family and a prediction of function or a link to a pathway or a specific metabolic area.

The final project has 3 components that will be graded individually.

1. **Weekly updates (15% of the grade).** To help the student organize the information gathered, three updates are required.

Update 1 : Summarize the results of a literature search you did on your family. Summarize the blast and family searches you did on this family Show a multiple alignment, a phylogenetic tree of the family and potential active sites visualized using Logos. What associations can you find using the String database. Any physical clustering with genes of known function? Any gene fusions?

Update 2: Can you find any associations with other genes using Microarray or RNA seq databases? Did you find binding sites for known transcription factors? Did you find any associations using other types of experimental data (fitness, phenotypes, physical interactions)?

Update 3: What structural information is there about members of your family? Were you able to build a structural model? Did you find or can you predict any ligand bound in the structure? Is this ligand biologically relevant or not? Can you predict interactions with nucleic acids or other proteins?

Update 4: Explore advanced tools that you can use on you family and present at least two. These can be: compare logos, Itol tree or mapping transcriptomic data (or metabolomic) to pathway maps.

IMPORTANT: The updates have to be submitted on time or you will not be able to participate in the peer-reviews assignments. I will be very strict on enforcing the deadlines with 50% off of the Update grade when submitted 12 hours late, and a zero on the assignment after 24H (plus a zero on the peer-review grade).

2. Peer review (15% of the grade)

The student will be assigned to two peer-reviews for each update (a total of 6). The student will need to complete the rubric provided as well as the feedback section. The grading performed by the student is only part of the author's feedback and will not affect the grade of the author. The feedback and analysis of the updates will be graded by the instructors (15% of the grade).

3. Written component individual assignment - Final Paper (35% of the grade)

The student will need to propose a functional hypothesis for your "unknown" and defend it in the paper using bioinformatic evidence. We **do not** expect a concatenation of the updates. An example of the type of work expected is the DUF71 paper that student will read in Module 4. The evaluation will be based on the clarity and the logic of your argumentation as well as the quality of the bioinformatic data presented. Finally, the adherence to correct scientific writing style will be evaluated.

STEPS:

1. Initial submission for per review
2. Peer review
3. Submission of final paper

COURSE SCHEDULE and DEADLINES are listed on CANVAS

Module 1 Dealing with the avalanche of data
Week 1: Extracting genomes and proteins from databases

Module 2 Linking gene and function
Week 2: From gene to pathway and from pathway to gene
Week 3: Using comparative genomic methods to identify missing genes

Module 3 Genome-wide analysis of experimental data & data Integration
Week 4: Techniques to study global gene expression. Mining gene expression databases and regulatory sites identifications
Week 5: Analyzing fitness and phenotype data, data integration, mapping data to pathway

Module 4 Mining and predicting 3D structures
Week 6: 3D structure visualization and mining and predicting of protein-protein, protein-ligand and protein nucleic acid interactions

Module 5 Data Visualization
Week 7: Visualization tools (Mapping data to phylogenetic trees, comparing logos, etc)

Final project submission, week 8
Final Project

March 8	Final paper submission (**for MCB 6318 only**)
Every Wednesday between March 10 and April 14	
	Period 2 final paper Q & A (**for MCB4934 only**)
April 19	Final paper DRAFT submission (**MCB4934-VDC1 only**)
April 21	Period 2 paper draft review (**MCB4934-VDC1 only**)
April 26	Final paper last submission (**MCB4934-VDC1 only**)

REFERENCE TEXTBOOKS:

These books are not required but cover many of the topics we will discuss in class:

Bioinformatics. A practical guide to the analysis of genes and proteins (Third Edition). Editors A.D. Baxevanis and B.F.F. Ouellette. 2004. John Wiley & Sons, Inc., Hoboken, New Jersey. ISBN 0-471-47878-4 (a fourth edition is in the works, but not released yet).

Bioinformatics: Genes, Proteins and Computers (First edition). Editors C.A. Orengo, D. Jones , J. Thornton. 2003. Bios Scientific Publisher, Oxford, UK. ISBN-10: 1859960545.

University of Florida Policies

Grades and Grade Points
For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Attendance and Make-Up Work
Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Services for Students with Disabilities
The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,* www.counseling.ufl.edu
  Counseling Services
  Groups and Workshops
  Outreach and Consultation
  Self-Help Library
  Wellness Coaching

- U Matter We Care, www.umatter.ufl.edu/

- *Career Connections Center,* First Floor JWRU, 392-1601, https://career.ufl.edu/.

Academic Resources

- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://elearning.ufl.edu/student-help-faqs/
- Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. http://www.crc.ufl.edu/
- Library Support, http://cms.uflib.ufl.edu/ask. 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. http://teachingcenter.ufl.edu/
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. http://writing.ufl.edu/writing-studio/

Course Evaluation

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.

Netiquette guide for online courses

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*" You are

expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Additional comments regarding academic integrity:
Students are encouraged to discuss material with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other once the quiz window is closed. However, the following is considered academic dishonesty, and I expect that no student will ever do any of the following:

- Have another person complete a quiz in this course
- Copy another student's quiz in this course
- Collaborate with anyone during a quiz in this course
- Discuss the questions and answers of a quiz with other students while the quiz window is still open
- Manipulate and/or distribute any materials provided in this course for any purpose (including course lecture slides).
- Use any materials provided by a previous student in the course

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.

Microsoft Office 365 Software is free for UF students

http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

Other free software is available at:

http://www.software.ufl.edu/

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357).

University of Florida Complaints Policy and Student Complaint Process

Most problems, questions and concerns about the course will be resolved by professionally communicating with the instructor or the TAs.

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

If a problem really cannot be resolved by communicating with the instructor or the TAs you can contact

- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

- Online Course: http://www.distance.ufl.edu/student-complaint-process.

This said, professionalism is a two-way-street. Unprofessional behavior of students includes, among other things: lack of communication, blaming other people or external factors, lying, affecting others negatively in a group or in the class, not accepting criticism and not being proactive in solving problems or seeking help. Furthermore, faculty often have family and other obligations to tend to. Over the weekend, replies to your inquiries or questions maybe delayed.
If a student is lacking professionalism repeatedly, the instructor has the rights to file formal complaint against the student through the Dean of Student office.

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Download PDF here

Couldn't create PDF for MCS Master Microbiome in Health and Disease_Final.pdf

Download PDF here

Online Master of Science Microbiology and Cell Science with a concentration in Microbiome in Health & Disease

Overview – Catalog/Website description of MS program

This concentration aims to provide students with knowledge in the emerging area of the microbiome and their contributions to human health. Recently, the field of Microbiome has become a driver in key areas of research, such as health homeostasis, disease onset and progression as well as their use as therapeutics.

Rationale and place in the curriculum:
The requirements for the Concentration in Microbiome and Health Online will provide students with expertise in this rapidly expanding field of microbiology.

Students obtaining the MS in this concentration would acquire skills to assist them in understanding key concepts in microbiome, host/microbe interactions, and advances in microbiome research. Additionally, students will develop core competency in current quantitative methods and technologies to study the microbiome and evaluation strategies, synthesizing key primary literature in the field and building critical thinking and writing skills.

This MS would be available to our online Microbiome in Health & Disease Certificate as well Environmental microbiology Certificate students as a self-funded program and as online MS for our on-campus students. This program is unique and would build on our department's research expertise and therefore content would not overlap with other Masters at UF.

MS Program Student Learning Outcomes:

By the end of this MS program graduate students should be able to:

1) Develop an in-depth comprehension and mastery of the fundamental concepts and quantitative methodology to study the microbiome;
2) Utilize bioinformatic tools to evaluate fluctuations in the microbiome composition
3) Integrate the knowledge gained in microbiome field with health outcomes and its translation into therapies;
4) Understand the role of the human microbiome in health and disease: in relation to protein conformational diseases (Alzheimer's, Parkinson's, ALS, Huntington's, etc); auto-immune disease (T1D, SLE, MS, etc); and viral infection (coxsackie viruses, noroviruses, polioviruses, rotaviruses, etc);

5) Understand the role of the human gut microbiome as a reservoir of antibiotic-resistant genes
6) Explore the short and long-term effect of antibiotic use on the human microbiome
7) Target the human microbiome to fight infectious diseases and antibiotic resistance
8) Understand the impact of the microbiome on the host physiology and immune system
9) Know tools to evaluate the role of the microbiome during pathogen outbreaks
10) Be proficient on the regulatory aspects of microbiome-based therapies
11) Analyze and discuss primary literature in the field of microbiome to improve critical thinking and evaluation skills; and
12) Refine scientific communication skills through writing scientific critiques, blogs and abstracts of primary literature articles.

Requirements for Entry:
For entry into University of Florida's online MS in microbiology and Cell Science with a concentration in microbiome in health and disease must have:

- A Bachelor of Arts (BA) or Bachelor of Science (BS) degree from a regionally accredited US institution or an international equivalent undergraduate degree.
- A strong science foundation, such as coursework related to microbiology, biology, ecology, cell biology, and chemistry (Note: online introductory microbiology courses are available to potential applicants if additional course work is needed, see below).

No GREs are required and students are allowed to enroll one semester at a time with no long- term commitment. Students are not required to enroll in a UF graduate degree program to complete the Master. Completed credits earned with a grade of B or better, however, may potentially be applied to a future advanced degree in Microbiology and Cell Science at UF. Enrolled graduate students can earn this MS concentration to complement their current M.S. or Ph.D. degree programs.

Credits Required: 30

To complete the MS concentration in Microbiome and Health, students are required to complete 18 credits of **foundation courses** and 6 credits from either the **microbiome/host interaction track** or 6 credits from the **microbiome quantitative track**. In addition, students are required to complete 6 **elective** credits.

Required courses **(18 credits)**

FOUNDATION COURSES –

Students are required to complete all six courses listed below (16 credits)

- MCB 6670c The Microbiome (S), 3 credits, letter-graded
- MCB 6424 Probiotics (S), 3 credits, letter-graded
- MCB 6937 Specials topics: Antimicrobial Resistance (F, S), 3 credits, letter-graded
- MCB 5505 Virology (F, S), 3 credits, letter-graded
- MCB 6937 Special topics: Applied Artificial Intelligence in Biological Sciences (F), 3 credits, letter-graded
- MCB7922 Journal Colloquy final literature review, 1 credit, (F, S, S-C)

Students are required to complete at least two of the courses below (2 credits)

- MCB6937 Special Topics: Regulatory aspects of Microbiome-based therapies (F) 1 credit, letter-graded
- MCB7922 Journal colloquy Mechanisms of Host/Microbiome interactions (F,S) 1, letter-graded
- MCB7922 Journal colloquy Virome/host interactions (S-C,S) 1 credit, letter-graded
- MCB7922 Journal colloquy Microbiome therapeutics/clinical trials (S-C) 1 credit, letter-graded

Students have the option to choose a Microbiome/host interaction path or a Microbiome Quantitative path

A. Microbiome/host interaction Track, 6 credits

Required (3 credits):

- PCB 5235: Immunology (S), 3 credits, letter-graded

Select ONE of these (3 credits)
- MCB 6937 Bacterial Physiology (F), 3 credits, letter-graded
- MCB 5205 Microbiology of Human Pathogens (F), 3 credits, letter-graded
- MCB6151 Prokaryotic Diversity (S-C) 3 credits, letter-graded

B. Microbiome Quantitative track, 6 credits

Required (5 credits)
- BSC6459 Fundamentals in Bioinformatics (F), 3 credits, letter-graded
- MCB 6318 Comparative Microbial Genomics (S), 2 credits, letter-graded

Select ONE of these (1 credits)

- MCB6937 Special Topics: Regulatory aspects of Microbiome-based therapies (F) 1 credit, letter-graded
- MCB7922 Journal colloquy Mechanisms of Host/Microbiome interactions (F) 1, letter-graded
- MCB7922 Journal colloquy Virome/host interactions (S) 1 credit, letter-graded
- MCB7922 Journal colloquy Microbiome therapeutics/clinical trials (S-C) 1 credit, letter-graded

ELECTIVE COURSES

Students are required to complete 6 elective credits. ***Courses not selected for the required track can also be selected as an elective***

- BSC6459 Fundamentals in Bioinformatics (F), 3 credits, letter-graded
- MCB 5205 Microbiology of Human Pathogens (F), 3 credits, letter-graded
- MCB 5705 Astrobiology (S), 3 credits, letter-graded
- MCB 6151 Prokaryotic Diversity (S-C), 3 credits, letter-graded
- MCB 6318 Comparative Microbial Genomics (S), 2 credits, letter-graded
- MCB 6355 Microbial/Host Defense (S) 1 credits, letter-graded
- MCB 6937 Human Genomics (F), 3 credits, letter-graded
- MCB 6937 Microbial Applications of Synthetic Biology (F), 3 credits, letter-graded
- MCB 6937 Post Translational Modifications in Microbiology (Sc), 2 credits, letter-graded
- MCB 6937 Methods to Study Prokaryotic Transcriptional Regulation (S), 1 credit, letter-graded
- MCB 6937 Molecular Bioinformatics in UNIX (S-C), 3 credits, letter-graded
- MCB 6937 Bacterial Physiology (F), 3 credits, letter-graded
- MCB 6937 Molecular Genetics (F,S,Sc), credits, letter-graded
- MCB 6940 Career Seminar (F, S, S-A), 1 ch, S/U grade
- PCB 5235 Immunology (S), 3 credits, letter-graded

Remedial Course – This course does not count towards Master program credits but may be recommended to students lacking a foundation in microbiology.

MCB 6937 Special Topics – Biology of Microorganisms (3 credits; Fall, Spring, Summer) – This course examines the structure, nutrition and growth of microorganisms; characterization of representative microorganisms and viruses; metabolic properties and

introduction to microbial genetics, immunology and pathogenesis of microorganisms. Note this course is intended only for students who did not complete an upper division Microbiology course as an undergraduate student.

Suggested Semester-by-Semester Plan: The MS program is designed to be completed in two academic year; however, there is flexibility and students may begin the program in any semester during the academic year and also have the option of including courses during the summer semester.

A suggested plan is as follows:

Proposed course schedule for Microbiome Quantitative Track:

Year 1:

May-August Summer Bridge Program Opportunity (For UF undergraduates transitioning to UF MS)

Fall:

- MCB 6937 Specials topics: Antimicrobial Resistance (F, S), 3 credits, letter-graded
- MCB 6937 Special topics: Applied Artificial Intelligence in Biological Sciences (F), 3 credits, letter-graded

Spring:

- MCB 6670c The Microbiome (S), 3 credits, letter-graded
- MCB 6424 Probiotics (S), 3 credits, letter-graded

Summer:

- Course from the elective list, 3 credits

Year 2:

Fall:

- BSC6459: Fundamentals in Bioinformatics (F), 3 credits, letter-graded
- Course from the elective list, 3 credits
- MCB 6937 Regulatory aspects of Microbiome-based therapies (F) 1 credit, letter-graded

Spring:

- MCB 6318 Comparative Microbial Genomics (S), 2 credits, letter-graded
- MCB 5505 Virology (F, S), 3 credits, letter-graded
- MCB7922 Journal colloquy Virome/host interactions (S-C,S) 1 credit, letter-graded

Summer:

- MCB7922 Journal Colloquy final literature review, 1 credit, (F, S, S-C)
- MCB 7922 Journal colloquy Microbiome therapeutics/clinical trials (S-C) 1 credit, letter-graded

Proposed course schedule for Microbiome/Host Interaction Track:

Year 1:

May-August Summer Bridge Program Opportunity (For UF undergraduates transitioning to UF MS)

Fall:

- MCB 6937 Specials topics: Antimicrobial Resistance (F, S), 3 credits, letter-graded
- MCB 5505 Virology (F, S), 3 credits, letter-graded

Spring:

- MCB 6670c The Microbiome (S), 3 credits, letter-graded
- MCB 6424 Probiotics (S), 3 credits, letter-graded

Summer:

- MCB6151 Prokaryotic Diversity (S-C) 3 credits, letter-graded

Year 2:

Fall:

- MCB 6937 Special topics: Applied Artificial Intelligence in Biological Sciences (F), 3 credits, letter-graded
- Course from the elective list, 3 credits
- MCB 6937 Regulatory aspects of Microbiome-based therapies (F) 1 credit, letter-graded

Spring:

- PCB 5235: Immunology (S), 3 credits, letter-graded
- Course from the elective list, 3 credits

Summer:

- MCB7922 Journal Colloquy final literature review, 1 credit, (F, S, S-C)
- MCB7922 Journal colloquy Microbiome therapeutics/clinical trials (S-C) 1 credit, letter-graded

Online Master of Science Microbiology and Cell Science with a concentration in Microbiome in Health & Disease

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Students obtaining the MS in this concentration would acquire skills to assist them in understanding key concepts in microbiome, host/microbe interactions, and advances in microbiome research. Additionally, students will develop core competency in current quantitative methods and technologies to study the microbiome and evaluation strategies, synthesizing key primary literature in the field and building critical thinking and writing skills.

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4) Understand the role of the human microbiome in health and disease: in relation to protein conformational diseases (Alzheimer's, Parkinson's, ALS, Huntington's, etc); auto-immune disease (T1D, SLE, MS, etc); and viral infection (coxsackie viruses, noroviruses, polioviruses, rotaviruses, etc);

5) Understand the role of the human gut microbiome as a reservoir of antibiotic-resistant genes
6) Explore the short and long-term effect of antibiotic use on the human microbiome
7) Target the human microbiome to fight infectious diseases and antibiotic resistance
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- MCB 5505 Virology (F, S), 3 credits, letter-graded
- MCB 6937 Special topics: Applied Artificial Intelligence in Biological Sciences (F), 3 credits, letter-graded
- MCB7922 Journal Colloquy final literature review, 1 credit, (F, S, S-C)

Students are required to complete at least two of the courses below (2 credits)

- MCB6937 Special Topics: Regulatory aspects of Microbiome-based therapies (F) 1 credit, letter-graded
- MCB7922 Journal colloquy Mechanisms of Host/Microbiome interactions (F,S) 1, letter-graded
- MCB7922 Journal colloquy Virome/host interactions (S-C,S) 1 credit, letter-graded
- MCB7922 Journal colloquy Microbiome therapeutics/clinical trials (S-C) 1 credit, letter-graded

Students have the option to choose a Microbiome/host interaction path or a Microbiome Quantitative path

A. Microbiome/host interaction Track, 6 credits

Required (3 credits):

- PCB 5235: Immunology (S), 3 credits, letter-graded

Select ONE of these (3 credits)
- MCB 6937 Bacterial Physiology (F), 3 credits, letter-graded
- MCB 5205 Microbiology of Human Pathogens (F), 3 credits, letter-graded
- MCB6151 Prokaryotic Diversity (S-C) 3 credits, letter-graded

B. Microbiome Quantitative track, 6 credits

Required (5 credits)
- BSC6459 Fundamentals in Bioinformatics (F), 3 credits, letter-graded
- MCB 6318 Comparative Microbial Genomics (S), 2 credits, letter-graded

Select ONE of these (1 credits)

- MCB6937 Special Topics: Regulatory aspects of Microbiome-based therapies (F) 1 credit, letter-graded
- MCB7922 Journal colloquy Mechanisms of Host/Microbiome interactions (F) 1, letter-graded
- MCB7922 Journal colloquy Virome/host interactions (S) 1 credit, letter-graded
- MCB7922 Journal colloquy Microbiome therapeutics/clinical trials (S-C) 1 credit, letter-graded

ELECTIVE COURSES

Students are required to complete 6 elective credits. ***Courses not selected for the required track can also be selected as an elective***

- BSC6459 Fundamentals in Bioinformatics (F), 3 credits, letter-graded
- MCB 5205 Microbiology of Human Pathogens (F), 3 credits, letter-graded
- MCB 5705 Astrobiology (S), 3 credits, letter-graded
- MCB 6151 Prokaryotic Diversity (S-C), 3 credits, letter-graded
- MCB 6318 Comparative Microbial Genomics (S), 2 credits, letter-graded
- MCB 6355 Microbial/Host Defense (S) 1 credits, letter-graded
- MCB 6937 Human Genomics (F), 3 credits, letter-graded
- MCB 6937 Microbial Applications of Synthetic Biology (F), 3 credits, letter-graded
- MCB 6937 Post Translational Modifications in Microbiology (Sc), 2 credits, letter-graded
- MCB 6937 Methods to Study Prokaryotic Transcriptional Regulation (S), 1 credit, letter-graded
- MCB 6937 Molecular Bioinformatics in UNIX (S-C), 3 credits, letter-graded
- MCB 6937 Bacterial Physiology (F), 3 credits, letter-graded
- MCB 6937 Molecular Genetics (F,S,Sc), credits, letter-graded
- MCB 6940 Career Seminar (F, S, S-A), 1 ch, S/U grade
- PCB 5235 Immunology (S), 3 credits, letter-graded

Remedial Course – This course does not count towards certificate program credits but may be recommended to students lacking a foundation in microbiology.

MCB 6937 Special Topics – Biology of Microorganisms (3 credits; Fall, Spring, Summer) – This course examines the structure, nutrition and growth of microorganisms; characterization of representative microorganisms and viruses; metabolic properties and

introduction to microbial genetics, immunology and pathogenesis of microorganisms. Note this course is intended only for students who did not complete an upper division Microbiology course as an undergraduate student.

Suggested Semester-by-Semester Plan: The MS program is designed to be completed in two academic year; however, there is flexibility and students may begin the program in any semester during the academic year and also have the option of including courses during the summer semester.

A suggested plan is as follows:

Proposed course schedule for Microbiome Quantitative Track:

Year 1:

May-August Summer Bridge Program Opportunity (For UF undergraduates transitioning to UF MS)

Fall:

- MCB 6937 Specials topics: Antimicrobial Resistance (F, S), 3 credits, letter-graded
- MCB 6937 Special topics: Applied Artificial Intelligence in Biological Sciences (F), 3 credits, letter-graded

Spring:

- MCB 6670c The Microbiome (S), 3 credits, letter-graded
- MCB 6424 Probiotics (S), 3 credits, letter-graded

Summer:

- Course from the elective list, 3 credits

Year 2:

Fall:

- BSC6459: Fundamentals in Bioinformatics (F), 3 credits, letter-graded
- Course from the elective list, 3 credits
- MCB 6937 Regulatory aspects of Microbiome-based therapies (F) 1 credit, letter-graded

Spring:

- MCB 6318 Comparative Microbial Genomics (S), 2 credits, letter-graded
- MCB 5505 Virology (F, S), 3 credits, letter-graded
- MCB7922 Journal colloquy Virome/host interactions (S-C,S) 1 credit, letter-graded

Summer:

- MCB7922 Journal Colloquy final literature review, 1 credit, (F, S, S-C)
- MCB 7922 Journal colloquy Microbiome therapeutics/clinical trials (S-C) 1 credit, letter-graded

Proposed course schedule for Microbiome/Host Interaction Track:

Year 1:

May-August Summer Bridge Program Opportunity (For UF undergraduates transitioning to UF MS)

Fall:

- MCB 6937 Specials topics: Antimicrobial Resistance (F, S), 3 credits, letter-graded
- MCB 5505 Virology (F, S), 3 credits, letter-graded

Spring:

- MCB 6670c The Microbiome (S), 3 credits, letter-graded
- MCB 6424 Probiotics (S), 3 credits, letter-graded

Summer:

- MCB6151 Prokaryotic Diversity (S-C) 3 credits, letter-graded

Year 2:

Fall:

- MCB 6937 Special topics: Applied Artificial Intelligence in Biological Sciences (F), 3 credits, letter-graded
- Course from the elective list, 3 credits
- MCB 6937 Regulatory aspects of Microbiome-based therapies (F) 1 credit, letter-graded

Spring:

- PCB 5235: Immunology (S), 3 credits, letter-graded
- Course from the elective list, 3 credits

Summer:

- MCB7922 Journal Colloquy final literature review, 1 credit, (F, S, S-C)
- MCB7922 Journal colloquy Microbiome therapeutics/clinical trials (S-C) 1 credit, letter-graded

Cover Sheet: Request 16832

Changing of required course in MS program in Microbiology and Cell Science

Info

Process	Major Curriculum|Modify|Grad
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Jamie Foster jfoster@ufl.edu
Created	12/2/2021 12:26:49 PM
Updated	12/2/2021 12:48:14 PM
Description of request	There are two requested changes for the curriculum 1. MCB 6940 Career Seminar is no longer a required course 2. Adding a required MCB 7922 - Journal Colloquy Final Literature Review preparation course

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Microbiology and Cell Science 60100000	Eric Triplett		12/2/2021
MCS Online MS Course Plan_Current.docx MCS Online MS Course Plan_Revised_120221.docx					12/2/2021 12/2/2021
College	Pending	CALS - College of Agricultural and Life Sciences			12/2/2021
No document changes					
Graduate Council					
No document changes					
University Curriculum Committee Notified					
No document changes					
Graduate School Notified					
No document changes					
Office of the Registrar					
No document changes					
Academic Assessment Committee Notified					
No document changes					
College Notified					
No document changes					

Major|Modify_Curriculum for request 16832

Info

Request: Changing of required course in MS program in Microbiology and Cell Science
Description of request: There are two requested changes for the curriculum

1. MCB 6940 Career Seminar is no longer a required course

2. Adding a required MCB 7922 - Journal Colloquy Final Literature Review preparation course
Submitter: Jamie Foster jfoster@ufl.edu
Created: 12/2/2021 12:04:54 PM
Form version: 1

Responses

Major Name Microbiology and Cell Science
Major Code MCB
Degree Program Name M.S.
Undergraduate Innovation Academy Program No
Effective Term Earliest Available
Effective Year Earliest Available
Current Curriculum for Major Please refer to the attached word document for current curriculum

Please read all the requirements below that you must follow in order to graduate. If you have questions about course order or graduation requirements, contact your academic advisor, Jacqueline Lee, at jlee9@ufl.edu. If you have questions about registration or admission contact dess@ahc.ufl.edu.

Required courses

- Students are required to complete all four courses listed below

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 6940	Career Seminar	1	x	x	Sum A
BSC 6459	Fundamentals in Bioinformatics (not recommended for 1st or 2nd semester)	3	x		
BCH 5413	Mammalian Molecular Biology and Genetics (not recommended for 1st or 2nd semester)	3	x	x	Sum C
MCB 5252	Microbiology, Immunology & Basis for Immunotherapeutics	4		x	Sum A

- Students are required to complete at least one of the courses below
  - Note – GMS6121 and MCB5205 can both be taken and one can count as an elective

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 5205	Microbiology of Human Pathogens	3	x		
GMS 6121	Infectious Disease	3	x	x	Sum C

- Students are required to complete at least one of the courses below
  - Note – GMS7133 and MCB5505 can both be taken and one can count as an elective

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 5505	Virology	3			

x

GMS 7133 Advanced Molecular Virology (take GMS6121 first) 2

x x Sum C

• Students are required to complete at least three credits of module coursework listed below
o Note – module courses are offered during shortened periods throughout the semester

Course # Course Title Credits Fall Spring
MCB 6772 Advanced Topics in Cell Biology 1

x
MCB 6355 Microbial/Host Defense 1

x
MCB 6457 Metabolic Regulation (live class attendance required) 1

x
MCB 6937 Methods to Study Prokaryotic Transcriptional Regulation 1

x
MCB 6417 Microbial Metabolism and Energetics 1 x

MCB 6317 Molecular Biology of Gene Expression 1 x

MCB 6318 Comparative Microbial Genomics (grade of B+ in BSC6459 needed to enroll in this class) 2

x
• Students are required to complete at least one of the courses below

Course # Course Title Credits Fall Spring Summer
MCB 7922 Journal Colloquy 1 x x

GMS 7192 Journal Colloquy – Infectious Disease (take GMS 6121 prior or concurrently)
1 x x Sum C
GMS 7192 Journal Colloquy – Bacteriology (take GMS 6108 prior or concurrently)
1 x x Sum C

Elective Courses
• Students are required to complete 9-10 elective credits

Course # Course Title Credits Fall Spring Summer
MCB 6937 Microbial Applications of Synthetic Biology 3 x

MCB 6937 Bacterial Physiology 3 x

MCB 6937 Human Genomics 3 x

MCB 6656 Environmental Microbiology 3 x

MCB 6937 Applied Artificial Intelligence in the Life Sciences 3 x

GMS 6108 Bacterial Physiology, Antibiotics, and Genetics (grade of B+ in GMS6121 needed to enroll in this class) 3 x x Sum C
MCB 6937 Antimicrobial Resistance 3 x x

MCB 6937 Molecular Genetics 3 x x
PCB 5235 Immunology 3

x

GMS 6132 Introductory Gene and Immunotherapy (take GMS6121 or MCB5205 first) 2 x x Sum C
MCB 6424 Probiotics 3

x

MCB 6670c The Microbiome 3

x

MCB 5705 Astrobiology 3

x

MCB 6937 Post Translational Modifications in Microbiology 2

Sum C
MCB 6151 Prokaryotic Diversity 3

Sum C

Introductory Course Track
- These 2 courses are required for students in the Introductory Online MS track only. Students with prior experience in Microbiology and Biochemistry do not need to take these courses. Your admission email will indicate if you need to take these courses.

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 6937	Biology of Microorganisms	3	x	x	Sum A
GMS 5905	Fundamentals in Biochemistry	4	x	x	Sum C

Graduation
- Students must take at least 3 credits in the final fall/spring (2 in summer) semester to graduate.
- 30 credits are required to complete the degree (37 credits required in introductory online MS track).
- Only courses completed with a grade of C or higher can be counted towards the degree.
- You must maintain both a 3.0 overall GPA and 3.0 major GPA (MCB, PCB, or BSC prefix) in

order to graduate.
- 15 credits must be completed in major courses with a MCB, PCB, or BSC prefix.
- Satisfactorily complete a comprehensive examination in the final semester of coursework: https://microbiologyonline.ifas.ufl.edu/wp-content/uploads/MS_final_exam_instructions.pdf

Proposed Curriculum Changes There are two requested changes for the curriculum

1. MCB 6940 Career Seminar is no longer a required course

2. Adding a required MCB 7922 - Journal Colloquy Final Literature Review preparation course

UF Online Curriculum Change Yes
Pedagogical Rationale/Justification
1. MCB 6940 Career Seminar is no longer a required course - When we started the MS program we thought most of the students would be earlier in their careers and use the MS degree program to prepare for professional school applications. However, it turns out most of our MS student population are career professionals that are using the MS degree for a promotion within their companies or to fulfill their current job qualifications (e.g. secondary HS teachers); therefore, many of the students have stated they do not need this Career Seminar course. So we are making it an elective course rather than a required course.

2. Adding a required MCB 7922 - Journal Colloquy Final Literature Review preparation course - All students must submit a final literature review assessment in their last semester to graduate from the non-thesis program. Some students appear to have trouble adhering to the imposed deadlines even through we have given the students the guidelines and instructions when they enter the program. We are creating a required course to help provide students with a structure and defined timeline to complete this final programmatic assessment.
Impact on Enrollment, Retention, Graduation 1. MCB 6940 Career Seminar is no longer a required course
This change will likely change the overall enrollment in this particular course but will not likely impact retention or graduation. We now realize that not all students need this course as they have been working in a professional setting for several years.

2. Adding a required MCB 7922 - Journal Colloquy Final Literature Review preparation course
We hope that by adding this new course as a required course we will improve our graduation rates as approximately 5 - 10% students do not graduate in their intended semester because they miss deadlines. This course could add the necessary structure to help students graduate in a more timely way.
Assessment Data Review No student learning outcomes will be changed as a result of these proposed changes.
Academic Learning Compact and Academic Assessment Plan We anticipate no changes to the Academic Assessment plan or methods as a result of these two proposed changes.
Catalog Copy Yes

UF UNIVERSITY of FLORIDA

College of Agricultural and Life Sciences
Department of Microbiology and Cell Science

1355 Museum Drive
PO Box 110700
Gainesville, FL 32611-0700
352-392-1906
352-846-0950 Fax

Please read all the requirements below that you must follow in order to graduate. If you have questions about course order or graduation requirements, contact your academic advisor, Jacqueline Lee, at jlee9@ufl.edu. If you have questions about registration or admission contact dess@ahc.ufl.edu.

Required courses

- **Students are required to complete all four courses listed below**

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 6940	Career Seminar	1	x	x	Sum A
BSC 6459	Fundamentals in Bioinformatics (not recommended for 1st or 2nd semester)	3	x		
BCH 5413	Mammalian Molecular Biology and Genetics (not recommended for 1st or 2nd semester)	3	x	x	Sum C
MCB 5252	Microbiology, Immunology & Basis for Immunotherapeutics	4		x	Sum A

- **Students are required to complete at least one of the courses below**
  - Note – GMS6121 and MCB5205 can both be taken and one can count as an elective

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 5205	Microbiology of Human Pathogens	3	x		
GMS 6121	Infectious Disease	3	x	x	Sum C

- **Students are required to complete at least one of the courses below**
  - Note – GMS7133 and MCB5505 can both be taken and one can count as an elective

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 5505	Virology	3		x	
GMS 7133	Advanced Molecular Virology (take GMS6121 first)	2	x	x	Sum C

- **Students are required to complete at least three credits of module coursework listed below**
  - Note – module courses are offered during shortened periods throughout the semester

Course #	Course Title	Credits	Fall	Spring
MCB 6772	Advanced Topics in Cell Biology	1		x
MCB 6355	Microbial/Host Defense	1		x
MCB 6457	Metabolic Regulation (live class attendance required)	1		x
MCB 6937	Methods to Study Prokaryotic Transcriptional Regulation	1		x
MCB 6417	Microbial Metabolism and Energetics	1	x	
MCB 6317	Molecular Biology of Gene Expression	1	x	
MCB 6318	Comparative Microbial Genomics (grade of B+ in BSC6459 needed to enroll in this class)	2		x

- **Students are required to complete at least one of the courses below**

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 7922	Journal Colloquy	1	x	x	
GMS 7192	Journal Colloquy – Infectious Disease (take GMS 6121 prior or concurrently)	1	x	x	Sum C
GMS 7192	Journal Colloquy – Bacteriology (take GMS 6108 prior or concurrently)	1	x	x	Sum C

Elective Courses

- **Students are required to complete 9-10 elective credits**

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 6937	Microbial Applications of Synthetic Biology	3	x		
MCB 6937	Bacterial Physiology	3	x		
MCB 6937	Human Genomics	3	x		
MCB 6656	Environmental Microbiology	3	x		
MCB 6937	Applied Artificial Intelligence in the Life Sciences	3	x		
GMS 6108	Bacterial Physiology, Antibiotics, and Genetics (grade of B+ in GMS6121 needed to enroll in this class)	3	x	x	Sum C
MCB 6937	Antimicrobial Resistance	3	x	x	
MCB 6937	Molecular Genetics	3	x	x	
PCB 5235	Immunology	3		x	
GMS 6132	Introductory Gene and Immunotherapy (take GMS6121 or MCB5205 first)	2	x	x	Sum C
MCB 6424	Probiotics	3		x	
MCB 6670c	The Microbiome	3		x	
MCB 5705	Astrobiology	3		x	
MCB 6937	Post Translational Modifications in Microbiology	2			Sum C
MCB 6151	Prokaryotic Diversity	3			Sum C

Introductory Course Track

- These 2 courses are required for students in the Introductory Online MS track only. Students with prior experience in Microbiology and Biochemistry do not need to take these courses. Your admission email will indicate if you need to take these courses.

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 6937	Biology of Microorganisms	3	x	x	Sum A
GMS 5905	Fundamentals in Biochemistry	4	x	x	Sum C

Graduation

- Students must take at least 3 credits in the final fall/spring (2 in summer) semester to graduate.
- 30 credits are required to complete the degree (37 credits required in introductory online MS track).
- Only courses completed with a grade of C or higher can be counted towards the degree.
- You must maintain both a 3.0 overall GPA and 3.0 major GPA (MCB, PCB, or BSC prefix) in order to graduate.
- 15 credits must be completed in major courses with a MCB, PCB, or BSC prefix.
- Satisfactorily complete a comprehensive examination in the final semester of coursework: https://microbiologyonline.ifas.ufl.edu/wp-content/uploads/MS_final_exam_instructions.pdf

UF UNIVERSITY of FLORIDA

College of Agricultural and Life Sciences
Department of Microbiology and Cell Science

Please read all the requirements below that you must follow to graduate. If you have questions about course content or course order, contact your academic advisor, Jacqueline Lee, at jlee9@ufl.edu. If you have questions about registration or admission, contact dess@ahc.ufl.edu.

Required courses

- **17-18 credits of required courses must be completed before you can graduate.**
- **Students are required to complete ALL FOUR of the courses listed below.**

Course #	Course Title	Credits	Fall	Spring	Summer
BSC 6459	Fundamentals in Bioinformatics (not recommended for 1st or 2nd semester)	3	✓		
BCH 5413	Mammalian Molecular Biology and Genetics (not recommended for 1st or 2nd semester)	3	✓	✓	Sum C
MCB 5252	Microbiology, Immunology & Basis for Immuno-therapeutics	4		✓	Sum A
MCB 7922	Journal Colloquy – Final Literature Review - taken in final semester	1	✓	✓	Sum C

- **Students are required to complete at least ONE of the following:**
  - Note – GMS 6121 and MCB 5205 can both be taken and one can count as an elective

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 5205	Microbiology of Human Pathogens	3	✓		
GMS 6121	Infectious Disease	3	✓	✓	Sum C

- **Students are required to complete at least ONE of the following:**
  - Note – GMS 7133 and MCB 5505 can both be taken and one can count as an elective

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 5505	Virology	3	✓	✓	
GMS 7133	Advanced Molecular Virology (GMS 6121 pre-req)	2	✓	✓	Sum C

- **Students are required to complete at least ONE of the following:**
  - Note that taking additional journal courses can count as electives

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 7922	Journal Colloquy – Various rotating topics	1	✓	✓	Sum C
	-OR-				
GMS 7192	Journal Colloquy – Infectious Disease (GMS 6121 is prereq or coreq)	1	✓	✓	Sum C
GMS 7192	Journal Colloquy – Bacteriology (GMS 6121 is prereq)	1	✓	✓	Sum C
GMS 7192	Journal Colloquy – COVID-19 (GMS 6121 is prereq)	1	✓	✓	Sum C

Elective Courses

- Students must complete 12-13 elective credits to graduate (depending on required course choices)
- **Students are required to complete at least three credits of module coursework listed below**
    - Note – module courses are offered during shortened periods throughout the semester
- Note that journal courses can count as electives as well

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 6937	Microbial Applications of Synthetic Biology	3	✓		
MCB 6937	Bacterial Physiology	3	✓		
MCB 6937	Human Genomics	3	✓		
MCB 6656	Environmental Microbiology	3	✓		
MCB 6417	Microbial Metabolism and Energetics (module)	1	✓		
MCB 6317	Molecular Biology of Gene Expression (module) Pre-Req: MCB 6937 Molecular Genetics	1	✓		
MCB 6940	Career Seminar	1	✓	✓	Sum A
GMS 6108	Advanced Bacterial Physiology, Antibiotics and Genetics (grade of B+ in GMS 6121 or MCB 5205 needed to enroll)	3	✓	✓	Sum C
GMS 6132	Introductory Gene and Immunotherapy	2	✓	✓	Sum C
MCB 5270	Antimicrobial Resistance	3	✓	✓	
MCB 6937	Molecular Genetics	3	✓	✓	
MCB 6772	Advanced Topics in Cell Biology (module)	1		✓	
MCB 6355	Microbial/Host Defense (module)	1		✓	
MCB 6937	Methods to Study Prokaryotic Transcriptional Regulation (module)	1		✓	
MCB 6318	Comparative Microbial Genomics (module) Pre-Req: BSC 6459 with grade of B+	2		✓	
PCB 5235	Immunology	3		✓	
MCB 5705	Astrobiology	3		✓	
MCB 6937	Probiotics	3		✓	
MCB 6670c	The Microbiome	3		✓	
MCB 6937	Post Translational Modifications in Microbiology	2			Sum C
MCB 6151	Prokaryotic Diversity	3			Sum C

Introductory Course Track

- These two courses for seven credits are required in addition to the standard 30 credits for students in the Introductory Online MS track only. It will be noted in your admission email if you are required to take either of these courses. Both courses are available as electives, if desired (*requires department permission to register).*

Course #	Course Title	Credits	Fall	Spring	Summer
MCB 6937	Biology of Microorganisms	3	✓	✓	Sum A
GMS 5905	Fundamentals in Biochemistry	4	✓	✓	Sum C

Graduation

- Students must take at least three credits in the final fall/spring (two in summer) semester to graduate.
- Thirty credits are required to complete the degree (37 credits required in introductory online MS track).
- Only courses completed with a grade of C or higher can be counted towards the degree.
- Students must maintain both a 3.0 overall GPA and 3.0 major GPA to graduate.
    - A lower GPA will result in academic probation
- Fifteen credits must be completed in major courses with a MCB, PCB, or BSC prefix.
- Satisfactorily complete MCB 7922 – Final Literature Review in the last semester of coursework: http://microbiologyonline.ifas.ufl.edu/student-resources/graduation-info/

Cover Sheet: Request 16867

Management and Sales Minor UFO

Info

Process	Program|Modify Platform|Ugrad/Pro
Status	Pending at CALS - College of Agricultural and Life Sciences
Submitter	Lisa House lahouse@ufl.edu
Created	12/13/2021 10:58:51 PM
Updated	1/11/2022 11:45:33 AM
Description of request	Proposing the addition of the Management and Sales Minor to UFO.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - College of Agricultural and Life Sciences	Joel H Brendemuhl	Approved	1/11/2022
UFO MSA minor proposal.docx					12/13/2021
College	Pending	CALS - College of Agricultural and Life Sciences			1/11/2022
No document changes					
Associate Provost for Undergraduate Affairs					
No document changes					
University Curriculum Committee					
No document changes					
UF Online					
No document changes					
SACS Director					
No document changes					
Office of the Registrar					
No document changes					
OIPR Notified					
No document changes					
Catalog					
No document changes					
Student Academic Support System					
No document changes					
College Notified					
No document changes					
Director of Institutional Assessment Notified					
No document changes					

Program|Modify_Platform for request 16867

Info

Request: Management and Sales Minor UFO
Description of request: Proposing the addition of the Management and Sales Minor to UFO.
Submitter: Lisa House lahouse@ufl.edu
Created: 12/13/2021 10:48:16 PM
Form version: 1

Responses

Name Management and Sales in Agribusiness
Major or Minor Code MSA
Effective Term Earliest Available
Effective Year Earliest Available
Differences from Residential Program The residential program calls for 4 required classes (AEB 3122 or 3144; AEB 3133; AEB 3300; and AEB 3341) and an approved elective from a set of 6 courses.
The proposed online program will have the same 4 required classes, but the approved electives list will differ as many of the 6 are not offered online.
The two approved electives that will be included for the online program will be AEB 4424 and AEB 3671.
Pedagogical Rationale/Justification To provide an additional options to UF Online students, with a focus on the food and agribusiness sector.
Impact on Existing Residential and Online Programs All courses for the minor are taught by the Food and Resource Economics Department. The only prerequisite course required for any of the courses in the minor is any economics course (ECO 2013, ECO 2023, AEB 2014, or AEB 3103). These courses are already taken by many students, so a large change in demand for the courses is not expected.
Offering the Management and Sales in Agribusiness minor in UF Online should have no impact on any existing residential undergraduate programs, though it might increase demand for the Master of Agribusiness program as students who complete the minor have the necessary prerequisites for this program. This program is also housed in the FRE department and there is room for increased student numbers. This may also attract students to the minor (and graduate program) at UF.

Management and Sales in Agribusiness - UFO

Proposed changes: Remove Approved 5 electives (not available online currently) and add AEB 3671 as an approved elective to provide two options for students.

Required Courses

Code	Title	Credits
AEB 3122 or AEB 3144	Financial Planning for Agribusiness Introduction to Agricultural Finance	3
AEB 3133	Principles of Agribusiness Management	3
AEB 3300	Agricultural and Food Marketing	3
AEB 3341	Selling Strategically	3
Approved elective		3
Total Credits		**15**
Course List		

Approved Electives

Code	Title	Credits
~~AEB 3315~~	~~Futures Markets and Risk Management in Agriculture~~	~~3~~
~~AEB 4138~~	~~Advanced Agribusiness Management~~	~~3~~
~~AEB 4309~~	~~Food Wholesaling and Retail Marketing~~	~~3~~
~~AEB 4342~~	~~Agribusiness and Food Marketing Management~~	~~3~~
~~AEB 4343~~	~~International Agribusiness Marketing~~	~~3~~
AEB 3671	Comparative World Agriculture	3
AEB 4424	Human Resources Management in Agribusiness	3
Course List		