BSC 2930 Special Topics

ANTS AND MICROBES™

SPRING 2021

3 credits, no prerequisites

Location Labs: Carr Hall

Tuesday 7th period (1:55-2:45pm)

Thursday: 7th & 8th (1:55-3:50pm)

Most Tuesday's classes will be via zoom (synchronous) or some outdoors. Some Thursday's classes will be done in a lab, some others outdoors and some via zoom (synchronous).

Teaching Team for Spring 2021

Dr. Marina Ascunce, Instructor and course coordinator, ascunce@ufl.edu
I am an evolutionary biologist with broad interests on host-parasite and environment interactions, biological invasions and climate change. My courses reflect my interdisciplinary research and are focus on hands-on learning activities, scientific literature discussion through teamwork, peer-instruction, and science communication.

Dr. Marie de Gracia Coquerel, Postdoctoral Associate Instructor, ma.degracia@ufl.edu
I am a Postdoctoral researcher. My interests are focused on ecology, environment and evolution.

Ms. Patricia Perez, Undergraduate Teaching Assistant, p.perez@ufl.edu

Ms. Jieli Wegerif, Undergraduate Teaching Assistant, jieliwegerif@ufl.edu

Guest lectures: The course may have three guest lectures TBD.

Course Description: This is a Classroom-based Undergraduate Research Experience (CURE) course. Microbiome sequencing is an important aspect in all areas of sciences from human health, to agricultural and environment. Our goal in this course is to introduce students to this new wealth of information and provide them with tools for using microbiome data. In particular, we are focusing on our own research on ants and microbes, as a way for the students to join an ongoing project and all the benefits of being in a research laboratory. Because ants are a non-traditional study group, this will provide the students the opportunity to think broadly as how these tools could be use and hopefully foster in them an unlimited way of approach scientific questions. As one of the University of Florida statements says: "We see things not as they are, but as they could be."

Our project on ants and microbes is embedded in an Interdisciplinary Research on Invasive Species (IRIS) project, and it aims to evaluate the role of microbes on invasive species and how they could be affecting native species. Thus, while our focus with this course would be to learn about microbes in ants, we will also explore aspects of invasion biology.

Course Format: This CURE course is limited to 10 students and combines hands-on molecular lab, article discussions and project presentations. It is an active-learning course; thus, students are expected to conduct the reading, watch the videos and do the pre-assessments before class. Please read the points below:

- The course will meet on Tuesdays 7th period via zoom synchronous or outdoors.
- The course has a lab part, for that we will meet on Thursday during two consecutive periods: 7th and 8th in Carr Hall (B014 & B020). During the labs, students will conduct DNA extractions, PCRs, running gels, and other lab procedures. For the lab section, students will work individually at the bench, and also forming team of 2-students for lab presentations (all the times students will maintain distance).
- Each team will be assigned a teaching assistant as a mentor.
- There will be one or two field trips on campus during the lab time, to show the students how we collect ants and to explore some of the ant community on campus.
- Students will learn basic tools to analyze sequence data from microbes.
- It is expected that the students meet outside the class time to prepare paper discussions and project presentations at least once a week.
- **Students should come to class having done any required reading or preparation, and ready to engage on active learning activities.** A 5-questions open book quiz will be done every week before coming to the lab class, students must complete the quiz to attend lab. Quizzes will be posted 24 hours before each lab.

Students-Teaching Team communications:
Students will be assigned a member of our teaching team for guidance and questions during the first week of classes, please email your designated teaching assistant and add **Ants and Microbes™** in the subject line of the emails. All assistants are available to meet via zoom with students by appointment via email request.
All email correspondence must be from your ufl.edu account, have your full name in the body of the email and our course number and section in the subject line. Emails not meeting these requirements may not be recognized by our email filters and thus, may not be answered.

Course goals:

Lesson Learning Goals:
Students will:

- Develop an understanding of the interdisciplinary scientific work.

- Practice critical thinking skills, to assess the relevance and importance of scientific findings.
- Learn how to obtain and analyze microbial high-throughput amplicon sequences.
- Increase confidence to take intellectual risks.
- Practice '*academic consciousness*' through engage in inclusive, respectful, and honest dialogs.

Lesson Learning Objectives:
The successful student will complete this course with a variety of new knowledge and skills. By the end of the course, students will be able to:

- List and perform the steps to obtain sequences for taxonomic inference.
- Interpret microbial community diversity using high-throughput amplicon sequences and databases.
- Compare microbial diversity within and between samples or treatments.
- Be able to work together in a team.
- Actively engage in classroom discussions, activities, and laboratory investigations.
- Practice scientific presentations and public speech.

Prerequisites: This course requires no previous experience in biological research. Basic population genetics concepts will be introduced, but not derived in this course. Students are expected to have a basic understanding of genetics and microbiology. The emphasis of this course is on practical aspects of data collection, analysis, teamwork and scientific presentations.

Readings: Reading materials and media will be available on E-learning or freely available on the internet.

Grading (out of 100 pts):
10 Attendance by joining classes via zoom and in person on time (tardiness will affect student's grade)
10 Participation in class discussions, activities, and whole class interactions
10 Team-work etiquette (i.e. not answering your team-member communications on time will affect your grade)
20 Quizzes (there will be short quizzes to cover lab protocols and other topics)
10 Leading Paper Discussion team based
10 Create your own Microbiome research project individual
10 Research Presentation team based
10 Background for Project Proposal Presentation
10 Participation on Undergraduate Symposium poster whole class co-creative activity

Grade and associated percent ranges %
A 93-100; A- 90-92; 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; E <60

For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx
Class Attendance: Class attendance is required and included in your grade. To receive full credit, you will need to come to class on time.

Participation: To receive full credit, you will need to come to class well prepared (having done any required reading or assignment), actively participate throughout the discussion/activity, and follow any instructions specific to the activity. We will use zoom breakout rooms and, if you are not actively engaged during breakroom activities, that will affect your grade. Participation points are earned by your presence and participation at each class meeting (laboratories, discussions and presentations) including zoom breakout rooms.

Presentations: Presentations are opportunities for students to deeply explore a particular topic and present the material to the class, gaining public speaking skills. There are going to be four (4) types of presentations. The first one is Leading Paper Discussion team based, where pair of students will present and discuss a scientific article. Second, create your own Microbiome research project individual, here each student in the class will provide a short presentation of what they would like to do research on. This is an open-ended activity, it could be based on a real problem or not. The focus of this presentation it is based on WHAT the student would like to research on and WHY. This second presentation will be used to create the third presentation: Research Presentation, which will be team based. The fourth presentation Background for Project Proposal Presentation will be based on one or two articles used as scientific background of the research presentation.

All the students will participate at the **UF Undergraduate Research Symposium**. We will decide to do a single poster or multiple posters tackling different aspects for all our CURE Ants and Microbes 2021. More TBD. Presenting: every student in the class will be paired with another student and both will be assigned a 30 min slot to present the course poster during the UF Undergraduate Research Symposium as much time as possible depending on their schedule.

Teamwork etiquette: Teamwork is required and included in your grade. To obtain full credit students are expected to:
- Show everyone respect.
- Agree to respectfully disagree.
- Respond to other team members communications on a timely manner: within 24 hours, ideally sooner if you can.
- Follow this suggested guideline for the project (edited from: https://www.usatoday.com/story/college/2013/05/14/5-group-project-etiquette-tips/37435605/)

Teamwork etiquette:

1. At the beginning of the project, evenly assign tasks and set deadlines for when you want to have certain parts of the project completed. This way, certain group members don't feel like they are doing everything, and everyone has a clear goal of when to complete their portion of the work.
2. Be flexible about when you can meet up to discuss the project. Group members will have busy schedules between classes, work and internship commitments. Can't meet up because your favorite TV show is on at that time? Be flexible and record it. That really isn't a legitimate reason if it means that another group member has to leave work early.
3. Tell your group members the best way to reach you (email, text) and respond within 24 hours, ideally sooner if you can. Sometimes not having a quick answer to a question can hold up the entire project. Responding quickly avoids frustration and gives your group members confidence that you are part of the team.
4. Keep the communication open. Update your group members about the progress you are making on your work. It also guarantees that everyone knows you are contributing.
5. Proofread your portion of the assignment. The saves time on the back end when groups members have to put everyone's work together. It shows that you cared about your work and the group's grade. It will also indicate that you looked over your materials and are prepared for the presentation.

Extra credit (no more than 5%)
You can discuss extra credit opportunities with your assigned member of our teaching team. Extra Credit Opportunities will be available throughout the semester and may include: Attending UF Conferences and Symposiums (e.g. Emerging Pathogens Symposium), Presentation of current topic in class and posting it to a discussion board. There are some extra credit opportunities that we encourage all of the students to participate. These activities are:
1) Participate in our outreach *virtual* days activities as part of "*The ImportANTS of Ants*" educational program, which is run by a team of UF undergraduate students: Patricia Perez, Tori Argenti and Jieli Wegerif and funded by UF Thompson Institute for Earth Systems (TIES). This current project is targeted to K-12 students at local and distant schools. The project proposes to use of hands-on activities and dialogue to explain the role invasive and native ant species have in the ecosystem. We engage the kids in learning how these ants live, their interactions with other species, explain the difference between invasive and native species, and why native ants are beneficial to the environment.
2) Collaborate in the developing of outreach material to use during "*The ImportANTS of Ants*" *virtual* educational program. Students will meet *virtually* with the team to develop and construct the educational material to be used during school visits.
3) Short (3 minutes) elevator speech type presentation via video (e.g. YouTube). Each student will create an end-of-course take-home message after the Ants and Microbes course, on what they would tell their friends and family about the course. More TBD.

Laboratory Safety
To comply with the University of Florida requirements closed toed shoes are mandatory in the laboratory. For more information about the regulations go to: http://www.ehs.ufl.edu/Lab/EHSintro.htm

Laboratory Hygiene
Students are going to follow all the health safety regulations established by UF. There will be sanitizer stations to wash hands or apply hand sanitizer and also to disinfect cellphones.

Cell Phones
Students are expected to turn off - or put on silent - and put away all cell phones during class sessions.

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

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. We also will ask students to please complete pre-course and post-course surveys.

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 behaviour 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

UF Policy on 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.

Accommodations 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 should first register with the Disability Resource Center at 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/ and provide appropriate documentation.

Campus helping resources: U Matter, We Care
At UF Every Gator Counts. U Matter, We Care serves as UF's umbrella program for UF's caring culture and provides students in distress with support and coordination of the wide variety of appropriate resources. Families, faculty, and students can contact umatter@ufl.edu seven days a week for assistance for students in distress.

The university's counseling resources are available for students experiencing personal problems that interfere with their general well-being and/or academic performance. It provides confidential counseling services at no cost for students that are currently enrolled with the university. Visit www.counseling.ufl.edu/cwc/

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

- Counseling Services
- Groups and Workshops
- Outreach and Consultation
- Self-Help Library
- Training Programs
- Community Provider Database

The CWC is offering telehealth services, crisis services, and online workshops.

- **If you are experiencing a mental health crisis** please call 352-392-1575 and ask to speak with an on-call counselor.
- Visit counseling.ufl.edu/virtual to find a schedule of upcoming **online workshops.**

Career Resource Center, First Floor JWRU, 352-392-1601, www.crc.ufl.edu/
The Career Resource Center's mission is to educate and create connections for the University of Florida community in order to facilitate the holistic career development of students.

Student complaints
If there is an issue in the course, please bring it to the instructor's attention. UF policies about more serious complaints are described in these documents.
- Residential Course: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf
- Online Course: http://www.distance.ufl.edu/student-complaint-process

UF Diversity Statement
The University of Florida is committed to creating a community that reflects the rich racial, cultural, and ethnic diversity of the state and nation. No challenge that exists in higher education has greater importance than the challenge of enrolling students and hiring faculty and staff who are members of our country's diverse groups. This pluralism enriches the university community, offers robust academic dialogues, and contributes to better teaching and research. The University benefits from the richness of a multicultural student body, faculty, and staff who can learn from and support one another. Diversity and inclusion empower and inspire respect and understanding among us. Importantly, the University does not tolerate the actions of anyone who violates the rights of another person.
Through policy and practice, the university strives to embody a diverse and inclusive community, creating a university that truly reflects the greatness of our state and nation.
"Together we can accomplish academic excellence within our community, reflective of the rich culture and diversity of our state and nation." President Fuchs

Course outline (*as of December 10th, 2020) this is an outline and it is subject to change*; changes will be posted on the course Canvas site.

Week	Dates	Topics	Modality/Place
1	T: 01/12	Introduction, Syllabus, Team-work	Zoom
	R: 01/14	Methods of survey and collect ants. Laboratory safety training. Introduction Invasive Species.	Zoom
2	T: 01/19	Place pitfalls to collect ants, collect ants	Outdoors
	R: 01/21	Pick up pitfalls. Practice pipetting.	Outdoors and In person-lab
3	T: 01/26	Overview of DNA extractions, DNA quantifications, and PCR	Zoom
	R: 01/28	DNA extractions	In person-lab
4	T: 02/02	Bacteria and microbiome methods	Zoom
	R: 02/03	PCRs 16S	In person-lab
5	T: 02/09	Working in Excel	Zoom
	R: 02/11	Fungi and PCRs ITS	In person-lab
6	T: 02/16	How to run gels, Paper presentations	Zoom
	R: 02/18	Running PCR products 16S, Paper Discussion team based	In person-lab
7	T: 02/23	Guest speaker: Invasive Species at the global scale	Zoom
	R: 02/25	Team-based Paper presentations	Zoom
8	T: 03/02	Invasive and native organisms: Fact sheets	Zoom
	R: 03/04	Running ITS-PCR products	In person-lab
9	T: 03/09	Guest speaker: Insect Microbiome applications	Zoom
	R: 03/11	Student own Microbiome research project individual	Zoom
10	T: 03/16	Field trip on campus, Gainesville, Florida	Outdoors
	R: 03/18	Research Presentation team-based preparation. Working in Excel.	Zoom
11	T: 03/23	Guest speaker: Ants research in AI	Zoom
	R: 03/25	Introduction to R	In person-lab
12	T: 03/30	Preparing Poster for Undergraduate Symposium	Zoom
	R: 04/01	**Project Poster/Presentation Symposium**	Zoom
13	T: 04/06	Research Presentation	Zoom
	R: 04/08	Research Presentation	In person-lab
14	T: 04/13	Background for Project Proposal Presentation	Zoom
	R: 04/15	Background for Project Proposal Presentation	In person-lab
15	T: 04/20	Extra-credit presentations and activities	Zoom