Population Ecology: Biology / EVPP 648

Fall 2022

Lectures: Online

Mondays 4:30-7:10 PM

Office hours: Mondays 11:15AM-12:15PM

**Instructor**: Dr. Daniel Hanley

**Email:** [dhanley2@gmu.edu](mailto:dhanley2@gmu.edu)

**Phone**: 703-993-1616

**Office**: Colgan Hall 446/444

**Course content:** In this course you will be introduced to the field of population ecology, which is a quantitative field of ecology focused on how populations change over time. We will learn about population regulation, age structures, survival, and interactions among populations. At its core, population ecology is similar the study of natural history (of which you may be familiar); however, the predictive frame-work of population ecology provides the tools necessary to estimate uncertainty and make informed predictions.

**Expectations and goals:** I expect that you will actively contribute to advancing your understanding of Population Ecology. You will develop an understanding of quantitative and theoretical approaches used in ecology, while studying how populations change over time. We will learn about how populations interact with one another, and how populations are studied at various levels of organization. Lastly, we will study classic and contemporary research which will provide you with laboratory and field approaches that you may apply to your own studies.

**Study partners:**

These are students in the class that you can call in case you miss class or need peer feedback.

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**Prerequisites:**

A general understanding of ecology is necessary. Rudimentary experience with mathematical formulae and an understanding of matrices is helpful, but will be introduced in this course.

**Text:**

Rockwood (2015) An Introduction to Population Ecology. Second Edition, Wiley Blackwell, West Sussex, UK

**Important Dates:**

Last day to add – 29 Aug. 2022

Last day to drop with full tuition refund – 6 Sept. 2022

Last day to drop with 50% tuition penalty – 13 Sept. 2022

Unrestricted withdrawal period (100% tuition penalty) – 14 Sept. to 27 Sept. 2022

Selective withdrawal period (100% tuition penalty) – 28 Sept. to 24 Oct. 2022

**Useful Campus Resources**:

Writing Center: (703) 993-1200; <http://writingcenter.gmu.edu>

University Libraries: “Ask a Librarian” http://library.gmu.edu/mudge/IM/IMRef.html

Counseling and Psychological Services (CAPS): (703) 993-2380; <http://caps.gmu.edu>

**Grading policies for Biology / EVPP 648**

|  |  |
| --- | --- |
| **Assignment** | **Grade (%)** |
| HW 1 | 15 |
| HW 2 | 15 |
| HW 3 | 15 |
| Participation | 5 |
| Presentation | 15 |
| Peer Review | 15 |
| Paper | 20 |
| **Total** | **100** |

Yourfinal grade will depend on your participation, three homework (HW) assignments, in-class participation, a presentation, a peer review, and a research paper. This table (below, right) illustrates the contribution of each component to your final grade.

**Homework assignments:** You willcomplete three homework assignments, that will assess your knowledge of topics in population ecology, while providing practical skill (in this field and the scientific field more generally). The first assignment will assess your ability to interpret population growth data. The second assignment will assess your ability to interpret age-structured datasets and project population trends. Both assignments will require that you engage with the literature and understand the plant and animal populations. Finally, for the third assignment you will work in a group to combine the information and text from your prior two assignments (collectively), into a rough draft of a paper showcasing an R package (to accompany our text book). For the latter, you will be individually assessed based on a letter to the editor, where you describe your group submission (group submission required).

**Participation:** I expect that students will contribute equally to paper discussions and in-class activities. Your participation will be assessed based on your contributions in class (oral or via the chat window) and also your active engagement with class assignments and activities (e.g., discussion board posts).

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| --- | --- | --- |
| **Grade (%)** | **Letter** | **GPA1** |
| 97 | A+ | 4.00 |
| 93 | A | 4.00 |
| 90 | A- | 3.67 |
| 87 | B+ | 3.33 |
| 83 | B | 3.00 |
| 80 | B- | 2.67 |
| 70 | C | 2.00 |
| 0 | F | 0.00 |
| 1Letter grade to GPA equivalency for graduate grades can be found at AP.3.2 (https://catalog.gmu.edu/policies/academic/grading/) | | |

**Presentations**: Each student will be responsible to deliver a 10-minute presentation on their research paper. The format of the presentation will emulate a scientific conference. The exact schedule and format of the student presentations will be determined later, and posted on Blackboard.

**Research paper**: Each student will be responsible for writing a scientific research paper. This paper must be relevant to population or evolutionary ecology; however, you will have a great deal of latitude on what subject you adopt for this paper, and my preference would be a topic that can advance your thesis, dissertation, degree requirements, or professional goals. The paper submission process will emulate the peer review process, and you will be provided with a guide outlining the formatting requirements and the rubrics I will use to assess your work. Use this as an opportunity to broaden your knowledge on your chosen topic. The assignment is a substantial portion of your grade, but should provide you with a measurable return on investment. Please begin discussing potential paper topics with me early in the semester.

**Grade calculation**: Your final grade (%) will be converted to a GPA according to the table to the right. Please note, graduate students will likely want to ensure their GPA is higher than 3.00 (dashed line). Further information is provided in AP.3.2 (link in table footer).

**Important Policies for Biology / EVPP 648**

**Late assignments:** All work before the start of lecture or lab via Blackboard submission. No late work will be accepted in this class. No other form of submission will be accepted.

**Extension**: Each student can have a single extension on any assignment this term. This is to provide you flexibility that you may require this term. Your request must come to me in writing *before* the deadline for that assignment. Extension requests that come *after* the due date will not be accepted. Use this wisely and for good reason, there is only one opportunity for an extension.

**Absences**: The only valid excuse is a medical excuse from a doctor, with a documentation. Expect that I will call the doctor’s office before your absence will be excused.

**Missed assignments and exams**: All assignments and exams will be distributed online, and you will have a week to complete them. If you have a valid medical reason for extending beyond this please notify me in advance of the due date. I will work with you to find a solution that is mutually agreeable and within the guidelines set by the Academic Policy.

**Extended time**: You will need to notify me at the beginning of the course if Disability Services has provided you with extended time (information in next section). If accommodations are arranged during the course, you must notify me in advance of the exam time. Each assignment should provide ample time to complete; however, I will follow recommendations of Disability Services.

**Distractions**: Engaging in activities not related to the course (e.g., gaming, email, chat, etc.) will result in a significant reduction in your participation grade. When/if in ‘in-person’ sessions, no using your cell phone to text during class unless permission is received beforehand for extenuating circumstances (e.g., child care arrangements, etc.). This is distracting for others in the class, and will result in a deduction to your participation grade. I expect you to do your work, and not impair any else’s ability to do the same.

**Note taking:** AllPowerPoints will be provided on Blackboard, with accompanying slides with space for notes in the margins. I strongly suggestion is that you download those and take notes on a printed copy of the slides.

**Exam preparation**: To do well, you will need to study all reading material, the lecture slides, and your notes from class. I will be available to help during office hours.

**Basic Course Technology Requirements:**

Activities and assignments in this course will regularly use the Blackboard learning system, available at [https://mymason.gmu.edu](https://mymason.gmu.edu/), as well as web-conferencing software (Zoom). In an emergency, students can connect through a telephone call, but video connection is the expected norm. Students are required to have regular, reliable access to a computer with an updated operating system (recommended: Windows 10 or Mac OSX 10.13 or higher) and a stable broadband Internet connection (cable modem, DSL, satellite broadband, etc., with a consistent 1.5 Mbps [megabits per second] download speed or higher. You can check your speed settings using the speed test on this website.)

**Course Materials and Student Privacy**

All course materials posted to Blackboard or other course site are private; by federal law, any materials that identify specific students (via their name, voice, or image) must not be shared with anyone not enrolled in this class.

**Course Recordings**

Some/All of our synchronous meetings in this class will be recorded to provide necessary information for students in this class. Recordings will be stored on the university Zoom account and linked to Blackboard. They will only be accessible to students taking this course during this semester.

**Important Policies for GMU courses**

**Honor Code:**

The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow are that:

(1) all work submitted be your own;

(2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and

(3) if you are uncertain about the ground rules on an assignment, ask for clarification.

No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using a relevant discipline-specific format (i.e., a method adopted by a peer-reviewed journal)

A simple listing of books or articles is not enough. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see me.

Mason is an Honor Code university; please see the Office for Academic Integrity for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously, and violations are treated gravely. In this class, when you are responsible for a task, you perform that task alone. When you rely on someone else’s work in an aspect of the performance of that task, you will give full credit. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

The content of this course (e.g., slides, notes, or exercises) may be the property of the textbook publisher or other third parties. All other course materials are the property of the University or of the individual instructor who developed them. Use this material freely for study and learning, but do not share this information. Republishing or redistributing course material (e.g., uploading it to web sites or linking to it through services like iTunes) violates the rights of the copyright holder and is strictly prohibited. There are civil and criminal penalties for copyright violation. **Publishing or redistributing this material in a way that might give others an unfair advantage in this or future courses may subject you to penalties for academic misconduct.**

**Disability Accommodations:**

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email:ods@gmu.edu | Phone: (703) 993-2474

**Diversity and Inclusion:** As a Mason faculty member, I will keep diversity in mind throughout the semester. I welcome and value individuals and their differences including race, economic status, gender expression and identity, sex, sexual orientation, ethnicity, national origin, first language, religion, age, and disability. If English is your second language, you may wish to work closely with me on writing a paper. In this manner you can achieve the highest possible score on that assignment.

**Sexual Harassment, Sexual Misconduct, and Interpersonal Violence:**

As a faculty member and designated “Responsible Employee,” I am required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s [Title IX Coordinator](https://diversity.gmu.edu/sexual-misconduct) per [University Policy 1412](https://universitypolicy.gmu.edu/policies/reporting-of-clery-act-crimes-andor-prohibited-sexual-conduct/). If you wish to speak with someone confidentially, please contact the [Student Support and Advocacy Center](http://ssac.gmu.edu/) (703-380-1434), [Counseling and Psychological Services](https://caps.gmu.edu/) (703-993-2380), [Student Health Services](http://shs.gmu.edu/), or [Mason’s Title IX Coordinator](https://diversity.gmu.edu/sexual-misconduct) (703-993-8730; [cde@gmu.edu](mailto:cde@gmu.edu)).

**Privacy:** Students must use their official GMU email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address. See other details about privacy restrictions (above).

**Schedule for Biology / EVPP 648**

Each class will cover a concept in Population Ecology that is associated with a reading assignment. Under the ‘Chapter’ column, I have listed the chapter from our textbook. I suggest that you read this before class begins. I will give you guidance for the most relevant sections. Under the ‘Activities’ column, I have listed our in-class (synchronous) activities. Under ‘Deadlines’ you will find important due dates (before class on that date). I will provide you an additional opportunity to improve your final paper, which will substitute a final exam. If you choose to have a second attempt, I will select your highest grade. This schedule is subject to change – any changes will be communicated in class and on Blackboard.

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| **Date** | **Lecture Topic** | **Chapter** | **Activities** | **Deadlines** |
| 22-Aug | Density Independent Growth | 1 | Introductions, R basics |  |
| 29-Aug | Density Dependent Growth | 2 | Functions and Packages in R |  |
| 5-Sep | **No class (Labor Day)** |  |  |  |
| 12-Sep | Population Regulation | 3 | Population growth and density dependence activity |  |
| 19-Sep | Populations with Age Structure | 4 | Homework discussion  Leslie matrix discussion and activity | HW1 due |
| 26-Sep | Metapopulation Ecology | 5 | Paper Discussion 1  Age structured data activity |  |
| 3-Oct | Life History Strategies | 6 | Paper Discussion 2 |  |
| *11-Oct\** | Interspecific Competition | 7 | Homework discussion | HW2 due |
| 17-Oct | Mutualistic interactions | 8 | Paper Discussion 3 | Citations due |
| 24-Oct | Host-Parasite Interactions | 9 | Paper Discussion 4 |  |
| 31-Oct | Predator-Prey Interactions | 10 | Paper Discussion 5 Developing an R package | Paper draft due |
| 7-Nov | Herbivore-Plant Interactions | 11 | Homework discussion | HW3 due |
| 14-Nov | Multi-trophic Level Interactions | 12 | Research paper discussion | Peer Review |
| 21-Nov | Student Presentations |  | Presentations Day 1 |  |
| 28-Nov | Course summary - wrap up lesson |  | Presentations Day 2 | Paper Due |
| *6-Dec* | *Reading period* |  |  |  |
| 12-Dec |  |  | Revisions to final paper – (as needed) |  |

\*Class meets on Tuesday 11 Oct. instead of Monday 10 Oct.