Syllabus BIOS 2300 Ecology

Time: MWF 12:20-1:10pm, Boggs B9

Instructors:

Dr. Emily Weigel

474E Clough

404-385-1713

emily.weigel@biosci.gatech.edu\*\*

Office Hours: Tuesdays 9-11am

Dr. Steve Diggle

A110 CE

404-385-5634

stephen.diggle@biosci.gatech.edu\*\*

Office Hours: By appointment

***\*\*When emailing, please put BIOS 2600 in the subject line to ensure we see it.***

Teaching Assistants:

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| Ana Clavere-Graciette | aclavere@gatech.edu | Mondays 11am-12pm, 1124 Ford ES&T |
| Sara Cleland | scleland7@gatech.edu | Fridays 10-11am, Clough 365 |
| Tajah Damm | tdamm3@gatech.edu | Tuesdays 2-3pm, Clough 365 |
| Katherine Ferguson | kferguson31@gatech.edu | Wednesdays 9-10am, Clough 365 |
| Kaitlin Slicker | kslicker3@gatech.edu | Thursdays 8:30-9:30am, Clough 365 |
| Emma Reinhardt | ereinhardt3@gatech.edu | Fridays 10-11 am, Clough 365 |
| Amelia Smith | asmith453@gatech.edu | Tuesdays 12-2pm, Clough 365 |
| Mary Stephens | mstephens64@gatech.edu | Tuesdays 2-3pm, Clough 365 |
| Brady Young | byoung44@gatech.edu | Fridays 2-3pm, Cherry Emerson Lobby |

Prerequisites:BIOS 1107 AND (BIOS 1107L OR BIOS 1207L) OR BIOL 1510 OR BIOL 1511

Minimum Grade of D

Course Description:

This is an **active-learning** class that stresses active problem solving as a way to understand Ecology specifically and science generally. You will be expected to be able to understand, apply, critique, hypothesize, predict, interpret and analyze using real data. These problem solving activities will take place in class, and will be the major vehicle by which you will learn. They often will be team-based. *There will be* ***NO LECTURES IN CLASS,*** *and* ***THERE IS NO REQUIRED TEXT.*** Lessons to prepare you for each class will be delivered remotely via videos on CANVAS. We will then spend class time on building your comprehension on the material you find the most difficult, based on pre-class assessments. You will play a prominent role in determining each day’s focus. In class or other assessments (such as the quizzes associated with lessons) will occur every day, and will be based in the given class lesson and in-class activities.

Course Scope and Objectives:

With respect to ecology, you will learn the theoretical and conceptual foundations for how individuals, species, and communities interact among themselves and with the environment. The course will stress processes that determine the structure and function of populations, communities, and ecosystems, often using quantitative tools. We also will examine applications of ecological principles to issues such as conservation and management.

By the end of this course, you will be able to:

1. Read, interpret, analyze, and explain primary literature that concerns ecology
2. Identify and interpret basic ecological concepts through data derived from observation, experimentation, and modeled simulation
3. Design and critique experiments and approaches to test hypotheses
4. Develop predictions, based on real data, for how an ecological system should behave, and apply your knowledge to novel scenarios
5. Effectively communicate scientific findings in oral and written English, as well as

in mathematical (symbolic) logic

Grading: Your final course grade will depend on the following combination of grades:

Lesson Quizzes 10%

In-Class Problem-Solving Activities 10%

Self-reflection 10%

Work Portfolio 10%

Midterm Exams (2 @ 17.5% each) 35%

Final Exam 25%

100%

We will assign final letter grades using the following scale:

A: ≥ 90.0%

B: ≥ 80.0% and < 90.0%

C: ≥ 70.0% and < 80.0%

D: ≥ 60.0% and < 70.0%

F: < 60.0

Graded Course Components:

* Lesson Quizzes (10%):

Quizzes are 2-4 questions that test your basic understanding of the lesson relevant to a give class period. They are administered using Top Hat, and are **due by 10 AM on the day of the relevant class period**. *Not understanding the material* ***before class*** *will considerably diminish your ability to solve the in class problems*. You will be able to take the quiz as many times as you like before the deadline. *Hence, we strongly encourage you to master this material rather than take short cuts.* *You are allowed one missed quiz, but it is your responsibility to assure you have a functioning device*.

* In-Class Problem-Solving Activities (10%): These constitute problems that you work on in class, generally individually, but sometimes in teams. These will be assessed by a variety of means, including questions answered in class using Top Hat, or turning in your work at the end of class. Most of the points will be awarded for participation and a good faith attempt to solve the problem, not on the “correct” answer. *Using a careful, deliberative and logical process is more important than “guessing” the answer correctly.*
* Self-reflection (10%): This is your opportunity to understand your own thinking and how well you understand the material. *It is intended to help you determine your level of understanding and to help you to identify strategies that do or do not work, so it is very important that you take this seriously.* You will be required to address these aspects **weekly**, submitting a short (e.g. paragraph) statement of what you believe you understand, what in particular helped you to understand, and what is preventing you from understanding. Assignments are due Friday by 11:55 PM on CANVAS, but you may submit them any time prior. Again, the emphasis is on engaging the question deliberately and with thoughtfulness; there is no correct answer. Thoughtless and perfunctory answers will receive no credit. You are allowed one missed or late assignment without penalty. **Assignments otherwise missed or turned in late will not be graded.**
* Work Portfolio (10%): **Bring this every day, including exam days.** This is a record of your work in class. Since you will often work in teams, and there is no textbook, it *is essential that you have your own record of the in-class problems, how you tried to solve them, and the appropriate conclusion.* This is your portfolio. It should include all the information you need to understand the problem and how you worked through it, and be contained in a good notebook. Each entry should indicate the date, a description of what you were asked to do, and record your observations etc. *It should reflect your work in class, but also your subsequent conclusions and thoughts*. Think of this as a study guide; again there is no single “right” way, and we are looking for your ability to describe the problem, the relevant facts, your conclusions, and any areas of uncertainty in a useful way. We will collect a random subset of these to examine at the end of each topic, and they will be returned by the next class.
* Exams (Midterms at 17.5% each, Final at 25%): Exams are a combination of short answer/multiple choice; focused questions on data interpretation, experimental design, or quantitative concepts; and essays that require you to synthesize material in different ways. The final will include questions addressing the last 3rd of the course, but also will be cumulative. Cumulative questions are either drawn from prior sections of the course or will require you to integrate material across the entire course.

Extra Credit Opportunities: Throughout the semester, periodic extra credit opportunities will be offered at the instructors’ discretion. Such opportunities are to get you further engaged with the material and the ecology of Atlanta more broadly. These opportunities will be posted to CANVAS and announced in class; please pay close attention to the requirements and deadlines for each opportunity.

Missed Exams: If you miss an exam for any reason, you will receive a grade of 0 (zero) on that exam unless you **petition us for a makeup exam within 24 h of the start of the missed exam**, and we approve your petition. Your petition must be submitted in writing (by e-mail) and must include documentation of a legitimate reason for missing the exam. You are encouraged to submit your petition before the exam if you know of your scheduling conflict in advance. We will consider each petition individually. Examples of legitimate reasons to miss an exam include documented illness, illness or death in your immediate family, and participation in official university activities. If we approve your petition, we will either administer a makeup exam or remove the missed exam from your grade calculation by using the weighted average of your other exam scores as your grade for the missed exam, making it completely neutral in your final point total.

How to succeed in this course:

* Attend, be on time, and participate actively: Because in class time is devoted to problem-solving and assessment, ***attendance is mandatory*.** We will allow 1 unexcused absence. Beyond this, there will be ***NO MECHANISM*** to make up assignments, quizzes etc that are missed because you did not come to class. The same policy applies to assignments that are missed because you were late. Excused absences include sickness (with a doctor’s note), official school activities, or in some cases major life emergencies or religious observance. You may be required to produce documentation of your activities, and these last exceptions will be decided on a case-by-case basis.
* Come prepared: It is **essential** that you come to class, and have prepared. **This means that you MUST**: have seen the video required for a given class and have completed the corresponding assessment on Top Hat prior to class. *The assessment for each lesson will be closed roughly 2 hours before class so that we have time to examine the results*. **Make sure** to have examined the video at least once, and completed the assessment **prior to this deadline.** Also, **make sure** that you have **a smart phone, tablet, or computer with you in class,** since this will be required for the in class activities.
* Use Technology for Class: Assessment class will take place via Top Hat (<https://tophat.com/>). *Please go to this site, sign up as a* ***student****, and download the application to the device or devices of your choice*. (The price is $26 for a semester). All assessments and presentations will be available on the Top Hat site and all other materials will be available on CANVAS.

Note that you are **required** to have a mobile device with Top Hat installed, and working, when you come to class. Beyond this, access to your device will be controlled in order to facilitate thinking. We reserve the right to penalize you (i.e. you will receive no credit for assignments on a given day) if you use your device for other purposes or when its use has been prohibited.

* Behave ethically: Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/.

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Note that we fully encourage you to study in groups, or watch lessons in groups and discuss the material. *However, all individual assignments should be done without the direct aid of others*. Please ask us if this is unclear to you.

Statement of Intent for Inclusivity: As members of the Georgia Tech community, we are committed to creating a learning environment in which all students feel safe and included. Because we are individuals with varying needs, we are reliant on your feedback to achieve this goal. To that end, we invite you to enter into dialogue with us about the things we can stop, start, and continue doing to make our classroom an environment in which every student feels valued and can engage actively in our learning community.

Tutoring:Georgia Tech offers a variety of free learning and communications support options. Learn about free tutoring resources at www.success.gatech.edu or at the Center for Academic Success’s tutoring desk in Clough Commons 273. For assistance with writing, consult the Communications Center (Clough Commons 447 or [commlab.gatech.edu](http://commlab.gatech.edu/)).

Learning Accommodations: If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or http://disabilityservices.gatech.edu/), as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail us as soon as possible in order to set up a time to discuss your learning needs.

Changes:Course content may vary from this syllabus to meet the needs of this particular class. Students will be notified in class by the instructors when adjustments to this syllabus are required.

Course Schedule:

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| --- | --- | --- | --- |
| Week | Date | Who | Lecture topic |
| 1 | 8/20/18 | Diggle | Introduction |
|  | 8/22/18 | Weigel | Energy flow and food webs |
|  | 8/24/18 | Weigel | Energy flow and food webs |
| 2 | 8/27/18 | Weigel | Energy flow and food webs |
|  | 8/29/18 | Weigel | Food webs: VERA |
|  | 8/31/18 | Weigel | Food webs: VERA |
| *3* | *9/3/18* | *----* | *Labor Day (No Class)* |
|  | 9/5/18 | Diggle | Population distributions |
|  | 9/7/18 | Diggle | Population distributions |
| 4 | 9/10/18 | Weigel | Population growth and regulation |
|  | 9/12/18 | Weigel | Population growth and regulation |
|  | 9/14/18 | Weigel | Population growth and regulation |
| 5 | 9/17/18 | Weigel | Population growth and regulation |
|  | 9/19/18 | Weigel | Population dynamics-metapopulations |
|  | 9/21/18 | Weigel | Population dynamics-metapopulations |
| 6 | 9/24/18 |  | TBD- Based on student needs |
|  | 9/26/18 |  | **Exam 1 (Energy Flow to Pop Dynamics)** |
|  | 9/28/18 | Weigel | Competition |
| 7 | 10/1/18 | Weigel | Competition |
|  | 10/3/18 | Weigel | Competition |
|  | 10/5/18 | Weigel | Predation |
| *8* | *10/8/18* | *----* | *Fall Break (No Class)* |
|  | 10/10/18 | Weigel | Predation |
|  | 10/12/18 | Weigel | Predation |
| 9 | 10/15/18 | Weigel | Predation |
|  | 10/17/18 | Diggle | Parasitism |
|  | 10/19/18 | Diggle | Mutualism |
| 10 | 10/22/18 | Diggle | Quorum Sensing |
|  | 10/24/18 | Diggle | Life History |
|  | 10/26/18 | Diggle | Life History |
| 11 | 10/29/18 | Diggle | Succession |
|  | 10/31/18 | Diggle | Succession |
|  | 11/2/18 | Diggle | Succession |
| 12 | 11/5/18 | Diggle | Biodiversity |
|  | 11/7/18 | Diggle | Biodiversity |
|  | 11/9/18 |  | TBD- Based on student needs |
| 13 | 11/12/18 |  | **Exam 2 (Competition to Biodiversity)** |
|  | 11/14/18 | Diggle | Biogeography |
|  | 11/16/18 | Diggle | Biogeography |
| 14 | 11/19/18 | Diggle | Biogeography |
|  | 11/21/18 | *----* | *Thanksgiving Break (No Class)* |
|  | 11/23/18 | *----* | *Thanksgiving Break (No Class)* |
| 15 | 11/26/18 | Weigel | Productivity |
|  | 11/28/18 | Weigel | Productivity |
|  | 11/30/18 | Weigel | Productivity |
| 16 | 12/3/18 | Diggle | Biogeochemistry |
|  | 12/12/18 |  | **Final Exam (11:20-2:10pm Boggs B9)** |

**Campus Resources for Students**

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

**Academic support**

* Center for Academic Success <http://success.gatech.edu>
  + 1-to-1 tutoring <http://success.gatech.edu/1-1-tutoring>
  + Peer-Led Undergraduate Study (PLUS) <http://success.gatech.edu/tutoring/plus>
  + Academic coaching http://success.gatech.edu/coaching
* Residence Life's Learning Assistance Program

<https://housing.gatech.edu/learning-assistance-program>

* + Drop-in tutoring for many 1000 level courses
* OMED: Educational Services (<http://omed.gatech.edu/programs/academic-support>)
  + Group study sessions and tutoring programs
* Communication Center (<http://www.communicationcenter.gatech.edu>)
  + Individualized help with writing and multimedia projects
* Academic advisors for your major

<http://advising.gatech.edu/>

**Personal Support**

Georgia Tech Resources

* The Office of the Dean of Students: <http://studentlife.gatech.edu/content/services>; **404-894-6367**; Smithgall Student Services Building 2nd floor
  + You also may request assistance at <https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?>
* Counseling Center: <http://counseling.gatech.edu>; **404-894-2575**; Smithgall Student Services Building 2nd floor
  + Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
  + *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at* ***404-894-2204****.*
* Students’ Temporary Assistance and Resources (STAR): <http://studentlife.gatech.edu/content/need-help>
  + Can assist with interview clothing, food, and housing needs.
* Stamps Health Services: <https://health.gatech.edu>; **404-894-1420**
  + Primary care, pharmacy, women’s health, psychiatry, immunization and allergy, health promotion, and nutrition
* OMED: Educational Services: <http://www.omed.gatech.edu>
* **Women’s Resource Center:** [**http://www.womenscenter.gatech.edu**](http://www.womenscenter.gatech.edu)**; 404-385-0230**
* **LGBTQIA Resource Center:** [**http://lgbtqia.gatech.edu/**](http://lgbtqia.gatech.edu/)**; 404-385-2679**
* **Veteran’s Resource Center:** [**http://veterans.gatech.edu/**](http://veterans.gatech.edu/)**; 404-385-2067**
* **Georgia Tech Police:** **404-894-2500**