

BIOL 425: Field Botany

Instructor

Dr. D Jennings

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Student Hours: Wednesdays 2-4 Cabell Library rm 250 (Science Hub Student Hours)

Note: I am happy to meet with you outside of the scheduled class time. Please send an email with several days and times in which you are available to meet to facilitate scheduling. My general schedule can be found here: [Dr. Js Schedule Link](#)

Course Description

Semester course; 1 lecture hours and 4 laboratory hours.(40 percent online, 60 percent field/laboratory) 3 credits. Prerequisites: BIOL/BIOZ 152, BIOL 200 and BIOL 300 or BIOL 310 or BIOL 317 or BIOL 318. Online discussions, reflections and assessments in conjunction with field experience. Explores the effects of environmental conditions on plant morphology and adaptations, with emphasis on plant anatomy, plant physiology and plant diversity.

This course/experience has been approved by the REAL Council as a: REAL Level 3 Course/Experience and offers the following REAL components:

Hands-on learning that engages the student in applying and exploring disciplinary knowledge in real-world settings

Mentored experiences wherein the instructor responds regularly to student work, supports student reflection and integration of learning throughout the activity, and encourages goal-setting for future learning

Guided reflection activities and assignments in which students are encouraged to articulate personal, civic, social, or academic learning; identify values and attitudes developed through the activity; and/or explore and clarify career goals.

Learning Goals:

By the end of the course you should be able to

1. Describe key elements of plant anatomy
2. Use a dichotomous key to identify individual plant species
3. Discuss the impact of environmental parameters on plant physiology and plasticity
4. Identify key environmental parameters in communities that affect plant diversity
5. Predict the distribution of plant species within specific communities
6. Describe research methods used to study plant communities
7. Discuss the relationship between field experiences and broader community impacts

8. Relate field based experiences to personal growth and development as a scientist

General Overview:

Using the nearby James River Park System as our lab, we will be exploring the diversity and distribution of plant species throughout different areas of the park. This means that we will spend our time together out in the park system identifying plants and collecting data on them (pictures, GPS coordinates, measurements). In addition, both in the field and online we will be studying why and how the environment impacts plant traits.

Materials:

- Field clothing: this includes long pants as we will be going into areas that have poison ivy. It is also suggested that you have sturdy shoes that you can walk long distances in as we do spend our field sessions on our feet moving along trails.
- A smartphone with a camera or an actual digital camera to take pictures of plants. I have found that you can cheaply purchase a macro lens for your phone from Amazon that works great for close up pictures.
- A backpack/bookbag to carry your tree guide, field notebook, water, sunscreen, bug spray and snacks (if you want them). You will need something to allow you to have your hands free for taking pictures and making notebook entries.
- A field notebook and keys for trees, shrubs and vines will be provided for you.

Course Policies and Expectations

Attendance:

This is a field-based lab that meets in the field (unless other-wise announced) two times a week. While the lab is schedule from 8:30 to 11:15, field work will begin promptly at 9am and be completed by 11am. The schedule time is to ensure that you have time to get to the field location and then to return from the field in time for other courses. You are expected to be at the field site at 9am, if we are going to a different site where transportation is provided you are expected to be at the Life Science Building promptly at 8:30am

Field site location and transportation:

The primary field location is within walking distance of the Monroe Park Campus (Life Sciences Building on Cary St.). You may choose to meet at 8:30 promptly at the Life Sciences Building walk with your professor to the site (~ ½ mile) or provide your own transportation to the field site(s) ensuring you will arrive before 9am. Transportation will be provided on the rare occasions when other more distant field sites are visited and you must be at the Life Sciences Building promptly at 8:30am on those days. These dates will be announced a week in advance and posted on the Canvas course site.

Expectations in the field:

You are expected to be dressed appropriately for field work. We will be in areas with rough terrain (uneven ground, rocks, wet and muddy ground) so appropriate footwear is expected (trail shoes, hiking boots, etc). In addition, poison ivy is common in all field sites so long pants are expected. You will also want sunscreen, bug spray and water, particularly in the first part of the semester when it is likely to be hot. While in the field you are expected to stay with the team, follow all directions, and behave appropriately (no climbing trees, risky behavior, etc). You are also expected to bring your field notebook, any keys provided and an electronic device for taking pictures every time. These are directly related to the mastery of skills in this course (see grading).

Online expectations:

Unless otherwise indicated all online work must be done by you without assistance from others in the course or outside the course. Due dates are provided for assignments and it is expected that you complete any field related assignments before arriving in the field. Completion of assignments before due dates is an element to mastery of skills in the course (see grading). At no time may you copy online assignments in any way and/or share them with individuals outside the class (including posting to online sites).

Grading:

Course grades will be based on the level of mastery of skills:

Skills

- Describe key elements of plant anatomy
 - Identify different anatomical parts of plants
 - Differentiate between types of leaf arrangement
 - Describe different leaf shapes
 - Draw/describe flower structures and arrangement
 - Explain the differences between categories of plants
 - trees, shrubs, vines, herbaceous
 - annual, biannual and perennial
 - monocots and dicots
 - native, non-native and invasive
- Identification of local plant species (native and invasive)
 - Use of a dichotomous key to identify trees, shrubs and vines, herbaceous plants
 - Description of key identifying features of common native and invasive plants
- Discuss the impact of environmental parameters on plant physiology and plasticity
 - Discuss the effects of varying light levels of plant morphology
 - Relate the availability of water to plant growth and morphology
 - Predict the impact of competition of plant growth and morphology

- Evaluate plant growth based on nutrient availability
- Describe the impact of humans on plant growth/morphology
- Identify key environmental parameters in communities that affect plant diversity
 - Describe key abiotic factors that can impact plant diversity
 - Describe key biotic factors that can impact plant diversity
- Predict the distribution of plant species within specific communities
 - Predict the plant species in an area based on environmental parameters
 - Discuss possible reasons for plant presence/absence in a local area
 - Discuss differences between native and invasive species in relation to the environment
- Describe research methods used to study plant communities
 - Identify methods used in published research studies
 - Interpret and explain figures from research studies
 - Design an experiment to answer a question related to plant communities/morphology/distributions
 - Present design, data and results of a preliminary research study

Mastery Levels:

Novice: Has minimal or textbook knowledge without connecting it to the practice, struggles to describe or demonstrate the skill, requires prompting to complete assigned tasks

Intermediate: Has basic knowledge of key aspects of the practice, can demonstrate the skill at some level, needs assistance or prompting to complete task

Proficient: Has good working and background knowledge of area of practice. Can demonstrate skill independently though may still have occasional errors. Is able to solve problems/answer questions through deliberate analysis and planning. Requires minimal or no prompting to complete assigned tasks.

Advanced: Working and background knowledge extends beyond minimal expectations. Demonstrates skill and/or knowledge easily with minimal errors. Solves problems or answers questions confidently. Ability to work independently.

Expert: Authoritative knowledge of discipline and ability to apply beyond the bounds of the current area. Skill demonstrated with relative ease. Able to take responsibility for going beyond existing standards and creating own interpretations. Demonstrate understanding of larger picture and applies alternative approaches to problems/questions.

Grading Scale

- A At least one Expert mastery, or Advanced mastery in four or more skills, minimum of proficiency in all others
- B A minimum of Advance mastery in at least two skills, minimum of proficiency in all others
- C A minimum of proficient mastery in all skills
- D Proficient mastery of at least 3 skills, intermediate mastery of all others
- F No proficient mastery of any skills

If you participate fully and do your best on all of the assignments and field work there is no reason you will not be able to earn a C. After that it will be the quality of your work and your mastery of skills that determines your final grade.

***** If at any point something happens that begins to hinder you ability to complete work or prevents you from fully participating with your best work contact me immediately. We can work together to ensure that you complete the course successfully. *****

VCU Academic Support and Policies

Students should visit <http://go.vcu.edu/syllabus> and review all syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.

VCU Course Policies

For a list of academic policies and procedures, please follow this link to [the Provost's statement on course policies \(Links to an external site.\)](#) (also included in the course syllabus).

VCU Academic Calendar

Check out this link to the [VCU academic calendar \(Links to an external site.\)](#) for an overview of important dates.

Student Success Resources

This link to the [VCU Student Success page \(Links to an external site.\)](#) collects resources for academic advising as well as a number of support services including the Writing Center, the Campus Learning Center, and more.

Accessibility

[The Student Accessibility and Educational Opportunity \(Links to an external site.\)](#) is the designated office on VCU's Monroe Park Campus charged with fostering an environment where all students have equal access to the University's programs, services, and activities. Contact SAEO for questions or concerns about accessibility and accommodations.

Library

[VCU Libraries \(Links to an external site.\)](#) offers research support, academic support, workshops, equipment, and many other students services. Visit their website for more information.



VCU Relevant, Experiential and Applied Learning

Supplemental Learning Plan: Course Classification

Updated and Revised 09.11.2020

INSTRUCTIONS:

1. Make a copy of this form and rename it
2. Identify the section of the form for the REAL level for which this course is being reviewed, and briefly complete the following questions. Feel free to cut and paste from the course syllabus, affiliated assignments/projects, etc.
3. Combine this document and other support materials (syllabus, etc.) into one pdf
4. Upload the combined pdf as part of the REAL Application for Course Classification

Please note:

- This form will be used by the REAL Curriculum Committee to ensure the course is classified at the appropriate level using a standard and uniform set of criteria based on pedagogical approaches.
- ALL course sections must comply with the answers you provide. REAL classification reflects the minimum expectation, that is, it reflects what every student enrolled in the course, regardless of modality or instructor, can expect.
- An exception to this rule are those applying for Service Learning designation. If you are applying for Service-Learning designation of a course section, please contact the Office of Service Learning for information regarding documentation needed for evaluation of your application.

Applicant Name (last name, first name):

Course Title:

Course Number:

Date of application:

LEVEL 1

Note: Level 1 engages students in hands-on learning activities. For Level 1 classification, complete the following three questions.

Hands-on

1. Describe the hands-on activity or activities that students complete during the semester
2. Estimate the amount of time students will spend on this active/hands-on experience
3. Describe how this experience reinforces one or more of the learning goals of the course

LEVEL 2

Note: Level 2 involves hands-on learning and EITHER reflection OR mentoring. Complete the three hands-on learning questions below and either the reflection or mentoring questions as appropriate.

Hands-on

1. Describe the hands-on activity or activities that students complete during the semester
2. Estimate the amount of time students will spend on this active/hands-on experience
3. Describe how this experience reinforces one or more of the learning goals of the course

Reflection

1. Describe how reflection will be purposefully embedded throughout this course
2. Indicate the specific learning objective(s) that the planned reflection activities/assignments will reinforce
3. Explain how the reflection activities/assignments will be used to evaluate student learning
4. Describe the proposed format for the reflection activity(ies) in this course (e.g., discussions, journaling, etc)

Mentoring

1. List the guidelines or parameters for mentoring that are being used in this course
2. Describe at least three points of contact during the semester where reciprocated exchanges between mentee and mentor will occur
3. Describe the strategy that will be used to evaluate the effectiveness of the mentoring used in this course

LEVEL 3

Note: Level 3 involves hands-on learning and BOTH reflection AND mentoring. Complete all 10 questions below.

Hands-on

1. Describe the hands-on activity or activities that students complete during the semester
During the field time students work on mastery of skills related to plant identification, diversity, distribution and environmental impacts. Students are engaged in both a small mid-semester project that focuses on engaging the public in local botany topics as well as a semester project that focuses on the design and implementation of a field research project.
2. Estimate the amount of time students will spend on this active/hands-on experience
Students spend between 4-5 hours per week in the field at locations within the James River Park System in Richmond. In addition they spent time (10-20 hours) outside of class working on both the mid-semester and semester projects.
3. Describe how this experience reinforces one or more of the learning goals of the course
The field experience engages students actively in using field based skills to not only identify plant species but also to apply existing knowledge in the discipline to predict the distribution of plant species. In addition, the field experience fosters skills needed to predict the impact of human disturbance and climate change on plant communities within a local environment. Familiarity

with the local community allows students to reflect on the impact of the local environments on the broader community and on themselves directly.

Reflection

4. Describe how reflection will be purposefully embedded throughout this course
The use of mastery grading allows students to assess their own learning and skills. By reflecting on their development they can determine areas where they need to engage in different ways or seek additional support. In addition, at several times during the course (start, midway and end) students will reflect on their goals and actions, changes in their knowledge and understanding, as well as their attitudes, and on how their experiences in the course have added to or changed their perspectives.
5. Indicate the specific learning objective(s) that the planned reflection activities/assignments will reinforce
 - Discuss the relationship between field experiences and broader community impacts
 - Relate field based experiences to personal growth and development as a scientist
6. Explain how the reflection activities/assignments will be used to evaluate student learning
In collaboration with the professor, students will assess their mastery of skills related to the course objectives. This will enable them to identify areas where additional work and support are needed to improve mastery level. Self-reflections will aid both the student and professor in gauging changes in skills and perceptions over the course of the learning experience.
7. Describe the proposed format for the reflection activity/activities in this course (e.g., discussions, journaling, etc.)
Students will be engaged in tracking their mastery which includes providing evidence of changes in skill levels
Students will keep a field notebook in which they record their observations as well as their thoughts and perceptions of both the field sites and their individual experiences
Students will be involved in discussions related to their field experiences in which they share their individual learning and work together as a community to develop a shared understanding of underlying concepts and issues
Students will individual reflect on their goals, participation, progress and growth as scientists and individuals over the course of the semester
8. Describe the way(s) in which reflection in this course will challenge students to think more critically
Assessment of their own progress and skill level will help students to think more critically about how they learn and ways in which they approach and master new situations
Reflections on their experiences in different environments will help them to synthesize both discipline based knowledge and knowledge of the communities in which they are engaged

Development and implementation of an individual research project will engage them in critical analysis of research design, problem solving, and evaluation of impact of the study beyond the course environment.

Mentoring

9. List the guiding principles or parameters of mentoring that are being used in this course

- Development of skills related to studying plant communities from the microlevel (individual plants) to the larger James River Ecosystem, involves feedback throughout the process.
- Discussion between student and mentor helps students to articulate their thoughts and experiences
- Interactions between mentor and the student help the student to gain confidence in their knowledge and skills as well as helps them to assess their areas that need improvement

10. Describe the format for the mentoring (e.g. virtual, in-person, group mentoring)

- Self-assessment of skills will be done through a shared mastery document in which both the student and mentor will provide feedback on progression
- During field experiences in-person one on one feedback will be provided related to the field based skills
- In-person and virtual mentoring will occur as students develop individual projects, including discussion of research question(s), design, data collection, problem solving, data analysis and presentation of finding
- Group mentoring will also occur during the field experiences as students progress from simple skills (identification) to more complex skills (prediction and analysis)

11. Describe how many ongoing points of reciprocated exchange between mentee and mentor will occur

Individualized feedback that focuses on the process of learning new skills and self-assessment of skill level will be provided consistently throughout the course. One-on-one and group sessions during the field experience, which is twice a week. Development of the research project, during initial development and implementation as well as prior to the final presentation of the project

12. Describe the strategy that will be used to evaluate the effectiveness of the mentoring used in this course

A final student reflection will focus on the students perceptions of the experience in relation to their growth and development and the impact of mentoring interactions

LEVEL 4

Note: Level 4 involves hands-on learning as well as a high level of both reflection and mentoring. Additionally, evidence of integration of learning must be present. Answer all questions below.

Hands-on

1. Describe the hands-on activity or activities that students complete during the semester
2. Estimate the amount of time students will spend on this active/hands-on experience
3. Describe how this experience reinforces one or more of the learning goals of the course

Reflection

4. Describe how reflection will be purposefully embedded throughout this course:
5. Indicate the specific learning objective(s) that the planned reflection activities/assignments will reinforce
6. Explain how the reflection activities/assignments will be used to evaluate student learning
7. Describe the proposed format for the reflection activity/activities in this course (e.g., discussions, journaling, etc.)
8. Describe the way(s) in which reflection in this course will challenge students to think more critically

Mentoring

9. Describe how weekly points of reciprocated exchange between mentee and mentor will occur
10. List the guiding principles or parameters of mentoring that are being used in this course
11. Describe the strategy that will be used to evaluate the effectiveness of the mentoring used in this course

Integrated Learning

12. Describe the assignments and exercises that will be used to promote critical thinking, synthesis, and transfer
13. Describe the artifact of learning (e.g., e-portfolio, capstone project) used in this course that will demonstrate how students have integrated their hands-on experience with academic/disciplinary knowledge
14. Explain the ways in which students will present/demonstrate their learning from this course.
15. Describe which of the explicitly stated learning outcomes/goals for this course relate to integrative learning
16. Explain how students' integration of learning will be assessed (e.g., AAC&U Integrative Learning VALUE rubric, etc)