



Biology 670 Ecological Applications

Lecture: MWF 9:30-10:20 Albertson Hall room 306,
3 cr.

Lab: T 8:30-11:20 Albertson Hall room 321, 1 cr.

Spring 2019

Instructor: Dr. Rob Channell

Office: Albertson Hall room 302

Office phone: (785) 628-4214

Office hours: MF 3:30-4:30

and by appointment

Email: RBChannell@FHSU.edu

Webpage: www.RobChannell.org

University Catalog Description

The application of the principles of landscape ecology, geographical information systems, and spatial analysis to biological systems and research. Requisites: PR, BIOL 395.

Course Prerequisites

Permission or completion of Biology 395 Ecology (or equivalent course)

Course Description

Modern ecology, conservation, and natural resource management makes use of theory, technology, and analytical techniques. The overarching goal of this course is to provide students a foundation for integrating these three aspects of ecology into research and practical applications.

Contact Policy and Procedures

I want to help students. I encourage students with issues or problems related to the course to talk with me before or after class or email me. If a student is having difficulty with class content, I encourage them to schedule a meeting by using the procedure described below.

Generally, I will respond to emails or attempts to schedule a meeting within 24 hours during the work week and within 48 hours on weekends. During holiday breaks and the summer, I might not be able to respond for considerably longer periods of time.

To schedule a meeting with me please go to this webpage:

<http://robchannell.org/schedule/Calendar.html>

Select 2 or 3 times on the calendar that we both have open. Send me those times in an email. In this email also include a brief description of what you would like to discuss at our meeting. I will respond to your request for a meeting – you will receive an email.

Do not attempt to schedule a meeting for a time less than 25 hours in the future.

Course Materials

This course uses Open Educational Resources (OER). There is no required textbook. Course materials are free and will be distributed through the course webpage.

<http://www.robchannell.org/teaching/ecoapps/index.html>

This course will make use of various forms of technology which will be provided.

Delivery Method and Course Structure

The lecture portion of the course will consist of lectures, problem sets, and simulations. The lab portion this course will consist of tutorials, exercises, simulations, and field experiences. Students might be required to complete tasks or readings prior to attending a specific lecture or lab.

Course Objectives

At the end of this course, you should be able to:

1. Describe the challenges and issues of applying ecology to management and conservation problems.
2. Explain the value of models, challenges to constructing models, and how they are used in ecology.
3. Discuss the conceptual foundation of modern ecology.
4. Explain how landscape ecology links conceptual ecology and its application.
5. Describe the elements of landscape ecology.
6. Develop a set of metrics to characterize a given landscape.
7. Discuss how organisms respond to landscape pattern.
8. Describe the electromagnetic spectrum and how it interacts with organisms.
9. Process basic remotely sensed data to provide ecological insight.
10. Interpret remotely sensed data.
11. Use GPS to collect ecological data.
12. Use GIS to construct maps and graphics.
13. Quantify spatial and temporal phenomena using GIS and other software to test ecological relationships.

Course Schedule

This schedule is subject to change.

Content will change depending on student interest and progress.

Students will be notified of changes through announcements in class or at the Blackboard course site.

Date/Week	Lecture topic (Chapter)
Jan 21/1	Martin Luther King day (no class)

Jan 23	Thought Experiment -- Paradigms and Ecology
Jan 24	Lab: GIS Skills 1
Jan 25	Science, Scale, and Ecology/ Applied Ecology
Jan 28/2	Models
Jan 30	Models
Jan 31	Lab: GIS Skills 2
Feb 1	Models
Feb 4/3	ETIB and Metapopulations
Feb 6	No class -- Assignment
Feb 7	Lab: No class - Assignment
Feb 8	No class - Assignment
Feb 11/4	Landscape Ecology
Feb 13	Process
Feb 14	Lab: GIS Skills 3
Feb 15	Process
Feb 18/5	Pattern
Feb 20	Quantification
Feb 21	Lab: GIS Skills 4
Feb 22	Quantification
Feb 25/6	Dynamics
Feb 27	Organisms in the Landscape
Feb 28	Lab: Fragstats
Mar 1	Coordinate and Projections Systems
Mar 4/7	Coordinate and Projections Systems
Mar 6	GPS
Mar 7	Lab: Projection and GPS/Research Project
Mar 8	GPS
Mar 11/8	Spring Break (no class)
Mar 13	Spring Break (no class)
Mar 14	Spring Break (no class)
Mar 15	Spring Break (no class)
Mar 18/9	Georeferencing
Mar 20	Georeferencing
Mar 21	Lab: Georeferencing and Project Discussion
Mar 22	Occupancy Models
Mar 25/10	Occupancy Models
Mar 27	Occupancy Models/Species Distribution Models
Mar 28	Lab: Presence
Mar 29	No class - Assignment
Apr 1/11	Species Distribution Models
Apr 3	Species Distribution Models
Apr 4	Lab: MaxEnt
Apr 5	Home Range Analysis
Apr 8/12	Home Range Analysis
Apr 10	Home Range Analysis
Apr 11	Lab: Home Range
Apr 12	Capture Mark Recapture
Apr 15/13	Capture Mark Recapture
Apr 17	Abundance Indices
Apr 18	Lab: Mark
Apr 19	Interpolation and Classification
Apr 22/14	Interpolation and Classification
Apr 24	Interpolation and Classification
Apr 25	Lab: Interpolation and Classification

Apr 26	Remote Sensing
Apr 29/15	Remote Sensing
May 1	Remote Sensing
May 2	<i>Lab: Multispectral Data and NDVI</i>
May 3	Problem Solving and Critical Thinking
May 6/16	Presentations
May 2	Presentations
May 3	<i>Lab: Photogrammetry</i>
May 4	Presentations
May 13	Final Exam (9:30-11:10 in AH306)

Assessment and Grading

Group project - 100 pts	A = 90--100%
Research project - 100 pts	B = 80--89.9%
Class project - 100 pts	C = 70--79.9%
Final exam - 100 pts	D = 60--69.9%
Quizzes - 120 pts	F < 60%
Assignments - 80 pts	
Lab exercises - 200 pts	

The **final exam** is comprehensive, but will focus on the major concepts and ideas of the course and not small details. The final is essay and short answer questions and definitions. There is no second part to the final exam.

Lab exercises will be the application of skills learned in lab or analytical techniques presented in lecture to solve practical problems of ecology, conservation, or management. Exercises will be 10-20 points and be due the week after they are assigned. Students are encouraged to discuss the solutions to lab exercises, but the work submitted by each student is expected to be the work of that student. Students submitting the same or similar work will be issued a 0 for the assignment. A second offense will result in the students receiving a U for the course. Penalties and enforcement are subject to the university's academic honesty policy.

The **research project** will be original, creative application of concepts discussed in this class. The project should also use analytical techniques discussed in class. The instructions and grading rubric for the research project will be provided when the project is formally assigned.

The **group and class projects** will be problem solving and analysis problems. The groups/class will be given an objective. Students will have to use concepts and techniques presented in class, and their judgement to develop a solution that meets the project objective. Instructions and grading rubric for these projects will be provided when the projects are formally assigned.

I will do my best to have items graded and returned to students within 1 week of them being submitted to me. Grades will be recorded and available to students at the BlackBoard course site.

I am happy to correct grading mistakes or errors in recording grades. You must bring the exam or assignment when requesting the correction. However, grades for exams, assignments, or the class are not debatable (i.e. do not ask for/expect your grade to be changed unless an error was made in the calculation of the grade).

Student Help Resources

Students have access to academic services, technical support and student services at Fort Hays State University. You can find the resources online at <http://www.fhsu.edu/ctelt/services/Student-Help-Resources/>

Course policies

Attendance

Students are expected to come to class and to be on time. Attendance will be checked daily. It is recognized that personal emergencies will arise during the course of the semester. If you have a prolonged illness, have someone contact the instructor. Approved absences include verifiable illness, college-approved activity (see note), death of an immediate family member, or field trip for another class.

There is no penalty for arriving late to class – I want you to be in class even if you are late. Students who arrive at class after roll has been taken will need to inform the instructor at the end of **that** class period that they were late and not absent.

Note: Students who miss a class for an approved school sponsored event will not be penalized. If you must miss a class for such an activity, you must supply the instructor with a written explanation containing the date of your absence prior to the day of your absence. If this is not done, you will be counted as absent. Emails or notes to excuse activity participants by the activity sponsor will not be accepted -- it is the student's responsibility.

Make-up Exams and Quizzes, and Late Assignments

Make-up exams are permitted in instances of approved absence (verifiable illness, college-approved activity -- prior notification necessary, death of an immediate family member). If you are going to miss an exam for an approved reason, you must contact the instructor prior to missing the exam (voice mail or email). Lecture exams must be made up within 1 week. Quizzes cannot be made-up.

Late assignments will not be accepted unless you have an approved absence. If you miss class on a day an assignment is due, it is your responsibility to communicate with the instructor about submitting the assignment in a timely fashion. If you do not communicate with the instructor in a timely fashion, you will receive a 0 for the assignment.

Extra Credit

It is your responsibility to get work done on time in an acceptable form. For this reason, no extra credit will be extended during the course of the semester.

Incomplete Grades

Incomplete grades will not be given except in rare instances when the student's performance has been significantly affected by circumstances beyond the control of the student (death of an immediate family member, hospitalization, etc.). The student needs to meet with the instructor as soon as possible to discuss the possibility of receiving an incomplete. The granting of an incomplete rests solely with the instructor.

Class Participation

Your participation is necessary to maximize what you get out of the class. Feel free to ask pertinent questions at any time. You will be asked questions during class and you are expected to respond.

Use of Technology

During lectures and labs, you are encouraged to use your laptop to take notes (though retention is not as effective as taking them by hand). You can bring phones to class and they can be on, but please keep the ringer on silent. Do not text or make calls during class. You are not allowed to record audio or video in class without specific permission from me. If I believe that you are using technology inappropriately in class, I will revoke your technology privileges - this cannot be debated or appealed.

University Policies

Academic Honesty Policy

Membership in the FHSU learning community imposes upon the student a variety of commitments, obligations and responsibilities. It is the policy of FHSU to impose sanctions on students who misrepresent their academic work. These sanctions will be selected by appropriate classroom instructors or other designated persons consistent with the seriousness of the violation and related considerations... Students participating in any violation of this policy must accept the consequences of their actions. Classroom instructors and/or university review/appeals committees and administrators will assess the sanctions for violation of this policy. The seriousness of the violation will dictate

the severity of the sanction imposed. More information can be found at http://www.fhsu.edu/academic/provost/handbook/ch_2_academic_honesty/

Statement of Accessibility and Services for Students with Disabilities

If you have a disability that may have an impact on your ability to carry out assigned course work and if you wish to seek any accommodations for this course, you must contact Services for Students with Disabilities (SSD). SSD is located in the Kelly Center, Picken Hall, Room 111, 785-628-4401. SSD will review your documentation and determine, with you, what academic accommodations are necessary and appropriate for you that can be accommodated in this course. All information and documentation of your disability is confidential and will not be released by SSD without your written permission. Students can find more information at <http://www.fhsu.edu/disability/get-access/>

Use of Computing Resources

Fort Hays State University (FHSU) provides computing resources and worldwide network access to its faculty, staff, and students for legitimate administrative, educational, and research efforts. As a member of the FHSU electronic community it is your responsibility to use computing resources ethically and responsibly. Members of the FHSU electronic community are expected to use computing resources ethically, and to exercise reasonable care in utilization of FHSU information systems or their components. More information related to privacy, responsibilities, things forbidden to do and use of email can be found at http://www.fhsu.edu/academic/provost/handbook/ch_1_computing_resources/

Withdrawal Policy

Students may drop full-semester (16-week) courses through 11:59:59 PM CT on the 28th/29th calendar day of the semester. Students dropping during this time period will not receive any notation on their transcript. Students who withdraw after this period and through 11:59:59 PM CT on the 70th calendar day of the semester will receive a notation on their transcript of withdrawal (W). No withdrawals allowed after the 70th calendar day of the semester. Students who drop/withdraw completely will receive a notation on their transcript of the date dropped/withdrawn. Students receiving financial aid have additional responsibility and should contact the Office of Student Financial Assistance in Picken Hall, 785-628-4408. (<http://www.fhsu.edu/registrar/academic-policies-and-information/>).

Important Dates

February 18 – Last day to withdraw without transcript record
April 1 – Last day to withdraw from a course

Notice of Non-discrimination

Fort Hays State University does not discriminate on the basis of gender, race, religion, national origin, color, age, marital status, sexual orientation, disability or veteran status in its educational programs, employment and all other activities. In addition, the university does not discriminate on the basis of a person's genetic information. FHSU is committed to an environment in which students, faculty, administrators, and staff work together in an atmosphere free from all forms of discrimination, harassment, exploitation and intimidation, including, but not limited to, verbal, physical, or written behavior directed toward or relating to an individual or group on the basis of their protected class status.

Individuals who believe they have been discriminated against or harassed on the basis of their protected class status or are victims of sexual harassment should report such acts to the university Equal Employment Opportunity Officer who will assist the grievant in seeking redress through the appropriate procedure. The university's Discrimination and Harassment Complaint Procedure applies to grievances involving students, administrators, faculty or staff. The EEO Officer may be contacted at 600 Park Street, Hays, KS 67601, (785) 628-4033.