

Conservation Biology

YID3201

Fall Semester 2017

Monday & Thursday 9-10:30 am; 14 Aug-21 Sep, and 9 October

**NOTE: mandatory fall break trip to Danum Valley, Sabah, Malaysian Borneo
24-30 September**

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Office Hours: Tuesday 4:30-6, Thursday 11-12:30, and by appointment

Course Description

This course is designed to give you an introduction to the principles of conservation biology, to familiarize you with field skills, and allow you to critically apply both to an original research question. Conservation Biology is the study of earth's biodiversity, its major threats, and means of mitigating those threats. General topics we will cover include factors driving trends in biodiversity, understanding threats to biodiversity, and the role of ecology and behavior studies in conservation. Additionally, we will cover wildlife survey and analysis skills that are commonly used in conservation. We will use a freely available textbook (Conservation Biology for All, Sodhi & Ehrlich, eds.) along with very recently published readings from the primary literature (chosen by the professor during the semester to assure that these are the latest available on a given topic), to help you understand the basic principles from the text in a current conservation context. Some example readings are listed below.

The final for this class is a research report in the form of a scientific journal article, on a conservation topic of your choosing. You should have some basic experience in this from your Foundations of Science class, and we will have class exercises to help hone your skills. Regardless of your eventual field in Environmental Studies or Life Sciences, these individual skills, and the larger skill of scientific writing, will be valuable to your pursuits. Additionally, this course will provide you with new challenges and allow you to acquire new skills regardless of your year in the College.

NOTE: This class has a required fall break trip to Danum Valley (Sabah, Malaysia), which will be partly funded by the College. Because of this required field time, the class will end within 10 days of fall break, freeing up the remainder of your semester for other classes.

Broader Contribution to ES and LS Majors

This class focuses on threats to biodiversity, and how to mitigate those threats. If you are an ES major, you have likely spent some time learning about policy related to such threats, but it's important to understand the biology behind such threats, as well as how to accurately identify valid vs irrelevant studies pertaining to a given conservation issue. Thus, this class will allow you to better evaluate conservation policy options.

Additionally, understanding patterns of diversity as we will do in the context of examining threats to that diversity, is essential to all life science majors. Further, life science majors need to be able to critically evaluate seemingly conflicting evidence regarding trends in population size and community diversity. This class will also improve your skills in data collection, analysis, and scientific writing, essential to the LS major.

Prerequisites:

None. This class is designed to be accessible to anyone who has taken the Common Curriculum science class(es), while being academically rigorous for students in all years in the College.

Learning Goals

By the end of the semester you should

- have a broad understanding of the major threats to biodiversity and be able to cite current examples from the literature on each.

- understand experimental study design, be able to collect valid data, understand the limits of your own data, utilize basic statistics to analyze your data, and write up the results in a concise manner.

- have a basic understanding of various wildlife survey techniques, understand what sorts of questions each technique can be used to answer, and how to properly interpret the results of each.

- be able to critically evaluate the strengths and weaknesses of studies in primary literature.

Course Materials:

Conservation Biology For All, 2010. *Sodhi & Ehrlich, eds.*

Available as a free

download: https://conbio.org/images/content_publications/ConservationBiologyForAll_reducedsize.pdf

Course Assessment Breakdown:

- Participation in class & field discussions/activities: 100 pts

- Assignments: 100

- Final Project: 200 pts

- TOTAL:** 400 pts

Note: on your written assignments, spelling & grammar count. One of the goals of college is to teach you to communicate clearly—and this includes proper grammar as well as spelling. I expect you to form complete sentences, to be able to articulate your thoughts clearly and succinctly, and to spell correctly. Points will be taken off if you do not do these things.

Assessments

Participation

I expect you to come to class having completed the assigned readings for the day, and to have thoughtful questions, either about content or for further discussion inspired by the content. We will occasionally have homework questions from the reading that will be discussed either in the following class, or via the Canvas

discussion boards, and your efforts in these will contribute to your participation grade. I will notify you on a weekly basis if I think you are performing below par on participation, and will provide each student with a formal assessment of their participation by the end of Week 3 (approximately half way through our class). If you have questions about your participation level, please come see me. Note that only College-approved absences (medical, VR note) will be excused.

The following assignments are designed to build to your final project, so doing well on them, and learning from them, will help you successfully complete your final.

Assignment 1: Study or experimental design (10 pts)

For this exercise, you will be given a set of questions to choose from (or you can come up with your own) and you will design a study or experiment to answer that question. To do this, you will need to reference primary literature on the topic to see what methods are appropriate, what possible outcomes your study might have, and how your results might be interpreted. This assignment requires you to think about possible topics of interest before we arrive at Danum Valley, and at the end of our first full day in the field, you will turn in to me a single page proposal for your final project.

Assignment 2: Data collection (20 pts)

In class and on our fall break trip, we will learn several different ways of collecting data relevant to conservation. You are expected to keep detailed notes, and to organize your data books and spreadsheets clearly. I will teach you how to appropriately organize data books and spreadsheets each day that we collect data, and will check in with each of you daily on your progress. At the end of the fall break trip, I will grade your overall data collection efforts.

Assignment 3: Data analysis (35 pts)

During our fall break trip, we will have several small exercises that involve data analyses. Each one will have clear goals, and you will be graded on how well you meet those, and on how well you understand the methods we are using. DO NOT hesitate to ask questions if there's something you don't understand!

Assignment 4: Scientific writing (35 pts)

This is a rough draft of your final, and should be viewed as an opportunity to get feedback on your final. This will be no more than 5 pages in total (12 pt font, double-spaced), so it is short and designed to allow me to give you feedback on your writing before you turn in the final.

Final: Scientific paper (200 pts)

You will write a scientific paper on a research topic of your choosing (I can help you choose a topic if necessary), with the goal of submitting it for publication in the Raffles Bulletin of Zoology, the publication of the Lee Kong Chian Natural History Museum. As such, you should familiarize yourself with the articles in the journal throughout the semester, and you will be required to format your paper according to the instructions for authors

(<http://lkcnhm.nus.edu.sg/nus/index.php/instructions>). You will choose your research project early in the week at Danum, collect data while we are there, and write up your project during Week 7. A detailed grading rubric will be handed out during the semester.

Late Assignment Policy

You are required to submit assignments on time. For every day that your assignment is late, your grade will be reduced by 10% (out of 100%).

Canvas Page Usage Policy

You are required to check Canvas weekly for updates to the syllabus.

Other Policies

The fall break field trip to Danum Valley is required for all students. You are responsible for arriving in Lahad Datu by 2pm on Sunday 24 September. Please email me your flight details as soon as you have them.

No personal electronic devices will be allowed in class.

Only College-approved absences (medical, VR note) will be excused (no make-up assignments will be given to non-approved absences)

Attendance:

Attendance to class is mandatory. This class relies heavily on discussion of each week's topics, and your presence is essential not only for your own learning, but for the learning of others. Absences will result in reduced grade for participation.

Academic Integrity

All of your work has to be your own and all sources and paraphrasing have to be noted and cited appropriately. This can be tricky to navigate early on in your college career, so if you have doubts or questions, please email me or come see me.

By a vote of the Faculty at Yale-NUS College, professors must refer any suspected instances of academic dishonesty to the Academic Integrity Committee for assessment and adjudication:

"Yale-NUS College expects its students to abide by the highest standards of academic integrity as a matter of personal honesty and communal responsibility. Acting with academic integrity requires that (a) students do their own work, (b) students not interfere with the work of others, (c) students accurately and honestly represent the content of their work, and (d) students properly attribute others' work. Violations of the College's academic integrity standards undermine both the community and the individual growth of students. Accordingly, they will be addressed with the utmost seriousness and sanctions ranging from grade penalties to expulsion. Examples of violations of academic integrity include plagiarism, copying or sharing homework answers, submitting work completed for one course as 'new' work for another course, or fabricating or falsifying research data. Professors are obligated to refer suspected lapses in academic integrity to the Academic Integrity Committee, which follows a set of policies and procedures

approved by the faculty when investigating and adjudicating cases.” Source: Yale NUS College Library, “Yale-NUS Policies on Academic Integrity.” (2014). In *Avoiding Plagiarism*. Retrieved from <http://library.yale-nus.edu.sg/plagiarism/>

Expected workload

As with all 5MC courses, this class is designed to take 12 hours of time each week, including class time. You are expected to regularly review your notes from lectures and review readings, so that you can call on past topics to inform any given day’s discussion. You should also come to class with at least a couple of questions, either about things you don’t understand, or how a given topic relates to other things we’ve covered, or how a conservation issue you’ve heard about might relate to our topics. You should also be constantly preparing for the final, in terms of reading primary literature related to your research project.

Schedule of Course Topics and Readings

Note: additional readings from the primary literature may be assigned. These will be posted on Canvas the week before a given class, and students will be notified by email of their presence.

WEEK 1

14 August

Introduction to class & 1st Chapter

Chapter 1: Conservation biology: past & present

17 August

Chapter 2: Biodiversity

WEEK 2

21 August

Chapter 4: Habitat destruction: death by a thousand cuts

24 Aug

Chapter 5: Habitat fragmentation and landscape change

WEEK 3

28 Aug

Chapter 6: Overharvesting

31 Aug

Chapter 8: Climate change

WEEK 4

4 Sep

Chapter 10: Extinctions and the practice of preventing them

7 Sep

Chapter 11: Conservation planning and priorities

WEEK 5

11 Sep

Chapter 13: Conservation in human-modified landscapes

14 Sep

Chapter 14: The role of people in conservation

WEEK 6

18 Sep

Chapter 16: The conservation biologist's toolbox—principles for the design and analysis of conservation studies

21 Sep

Pre-trip preparation & discussion

Readings: multiple readings from the primary literature will be put on the Canvas page to help you prepare for your trip. We will also start familiarizing ourselves with relevant field guides!

FALL BREAK: Field trip to Danum Valley!

SATURDAY 23 September: All students REQUIRED to arrive Tawau; transfer to Danum Valley

See below for tentative itinerary

Check out these photos of last year's trip!

<http://www.jasheridan.com/conservation-biology.html>

WEEK 7

No class meeting

5 October: Rough draft of final (Assignment 4) due by 5pm

WEEK 8

9 Oct

Rough drafts returned with comments

12 Oct

FINAL papers due to me by email by 5 pm

END OF CLASS! We may meet on this day or over this weekend to celebrate together—stay tuned for details!

Overview of important dates:

14 August: Classes start

23 September: All students arrive Tawau, transfer to Danum Valley

24 September: Assignment 1 due at end of day

28 September: Assignment 2 due

29 September: Assignment 3 due

5 October: Assignment 4 due (rough draft of final paper)

9 October: *rough drafts returned with comments*

12 October: FINAL due by 5pm. End of course

Tentative itinerary for fall break trip

23 Sep:

Students arrive Tawau; transfer to Danum Valley

Orientation & night survey for frogs (Palum Tambun)

Sunday 24 Sep:

Early AM: bird survey

Brekkie

Plant ID workshop

Lunch

Data entry, writing exercise

Night survey for frogs (Kalison)

25 Sep:

AM: Aquatic primary productivity: Palum Tambun

Afternoon: data entry & discussion of analysis

PM: Night survey for frogs (W6S5)

26 Sep

Early AM: bird survey

Brekkie

AM: Primary productivity: Kalison

Afternoon: data entry & writing exercise

PM: Night survey for frogs (Palum Tambun)

27 Sep

AM: Primary productivity: W6S5

Afternoon: Data entry, Introduction to GIS

PM: Night survey for frogs (one of three study streams)

28 Sep

Early AM: bird survey

Brekkie

AM: Independent student projects

Afternoon: Data entry, discussion of research projects, reflective writing

PM: Introduction to wildlife photography; night survey of pond amphibians

Friday 29 Sep: Students depart Danum Valley

Some useful links for conservation biologists (& those who want to be)

<https://openforests.com/project-all/>