



### Wildlife Disease Ecology

Disease is one of the major unpredictable factors that influences wildlife extinction. In the Anthropocene, humans have altered habitats and temperature regimes, and have introduced novel organisms such as domestic dogs and cats into natural systems. These changes predispose wildlife populations to become vulnerable to diseases while also facilitating their spill-over to humans. Deadly disease outbreaks such as the Bubonic Plague, Ebola, and even COVID-19 have not only caused human death and suffering, but have also crippled our economies and civilizations. In this seminar we will discuss major wildlife diseases, the ecology of their origin and repercussions on wildlife and humans. We will engage with the primary scientific literature, hear from scientists who research wildlife disease, and learn from the mistakes that humans have made along the way.

Three hours of lecture/discussion each week. **We will also try and make field visits, depending upon the availability of students and their schedules.**

### COURSE LOGISTICS

**Instructor:** [Prof. Stotra Chakrabarti](mailto:schakrab@macalester.edu); [schakrab@macalester.edu](mailto:schakrab@macalester.edu)

**How to address me:** I go by Stotra (*STOW-T-RA*), Prof. Chakrabarti (*CHAAK-RA-BARTI*), or Dr. Chakrabarti. My pronouns are he/him/his.

**Lecture:** MWF 8:30 am-9:30 am; OLRI 284 (**and/or virtual as the case may be**)

**Want to Meet?** Drop me an email or talk to me before/after class to schedule a meeting. I do not go by strict office hours but I will schedule a meeting based on your availability. **I also have an open-door and/or zoom-friendly policy, even if the door is closed! So, please find me around if you need help. I am always around to listen to you.** *I would be really keen to meet all of you one-on-one in the first 2 weeks to know more about you and your expectations from the course. Please reach out to schedule a zoom meeting with me in the first couple of weeks.*

**TA:** Eleanor Michaud; [emichau1@macalester.edu](mailto:emichau1@macalester.edu)

**How to address:** I go by Eleanor. My pronouns are she/her/hers

**Office Hours:** Tuesday 3:30-4:30 PM in Smail Gallery and over zoom at <https://macalester.zoom.us/j/92743794728>

**Email Policy:** I will respond to emails promptly between 9AM-5PM on weekdays; emails received after 5PM can take longer to respond. I often cannot answer emails over the weekend, so please plan accordingly.

**Course Presence:** The course primarily relies on experience and exposure (discussions, dialogues, observations, interactions with guest speakers etc.), and it will greatly benefit students to ‘participate and learn’. **You will earn most of the points if you just show up for class!** I will expect students to attend lectures regularly on time, unless there is an emergency (*which is absolutely fine*). You can take *3 leave of absences without questions* for the whole course, but an intimation would be appreciated, otherwise I will be worried about your well-being. Please inform me beforehand if you need more time off. **I am committed to be extra-sensitive towards the flexibility that is required in the special times that we live in currently, so please let me know what I can do to make this course more accessible to you. Please see the Covid Consideration Section at the end of the document for more details.** **If you are feeling perpetually low, remember we are going through a severe collective trauma for 18 months. It will have a significant, long-term effect on mental health. If you are getting out of bed and managing to do some things, then you are doing great!**

**Out of class work expectations:** Readings and paper responses should take ~1-2 hours. Longer assignments and group work, including presentations, will require some more time to be scheduled. If you are having trouble working in a group setting due to work or class scheduling conflicts, please let me know. **I want you to learn in this course but not rush to achieve that. Take your time. Also, please do not be afraid to make mistakes, we only learn when we make them. Remember “why do we fall? So that we can learn to pick ourselves up!” We are going to make mistakes together and learn together in this course.**

**Texts:** No general textbooks for this course, but book chapters and readings will be made available through Moodle.

**Developing your voice in science:** Science requires a balance of courage, humility and kindness – this is as true for undergraduates as it is for researchers at leading institutions. You need courage and confidence to pursue and develop new ideas and approaches, confidence to critique others’ ideas, and to follow your curiosity. But science also requires humility and empathy – identifying limitations, asking for advice, permissions, help and guidance, accepting appropriate criticism from others, and reflecting on improvements. **ASK QUESTIONS, CRITIQUE PEERS, BUT PLEASE DO SO WITH KINDNESS.** As you develop your thoughts and opinions in this class, be mindful that we are also collectively creating a community of learning.

## LEARNING GOALS

This course will make you aware of the fundamentals of wildlife disease ecology and different case examples, with a special focus on the Anthropocene. **The course is designed to facilitate the understanding of concepts relevant to wildlife disease ecology through interactions with researchers from around the world who are experts in their fields.** The course will provide you with the knowledge and skills necessary to navigate and understand issues related to wildlife disease at local, national, and international scales. **Through this course, I will help you to be aware of what it takes to be a wildlife disease and conservation researcher, and the avenues you can pursue.** By the end of the course, you should also be able to:

- Understand fundamental concepts, terminologies and essential tools pertaining to the study of wildlife disease ecology
- Recognize major threats to biological diversity across the globe from disease
- Understand the concept of One-Health
- Analyze and critique scientific publications
- Understand wildlife disease trends across the globe and the regulatory framework governing its mitigation.
- Demonstrate the ability to synthesize and communicate wildlife disease concepts and case studies through scientific as well as popular formats
- **Choose projects from across the world where you could take up internship opportunities and embark upon a journey to make a change!**

**ASSESSMENTS (1<sup>st</sup> assessments are not graded)**

**Mini-Quizzes:** It will comprise of 5 question quizzes based on class lectures, seminars and information. These are open-book quizzes and students can take the quiz before the class begins. Dates of the quizzes will be made available in the schedule and reiterated in class.

**Paper Responses:** Paper responses will be due on the day indicated in the course schedule. **The reading material as well the rubric will be made available ahead of time on Moodle so that you have ENOUGH time to prepare.** Please check Course schedule/Moodle for updates and timings. **Deadlines can be made flexible --- I want you to learn and not rush!**

**Twitter summary:** This will comprise of a gist of the paper in the form of 6-7 tweets. Students are allowed/expected to be creative in the use of images, memes, gifs etc. **There will be a total of 2 twitter summaries throughout the course.** Please check Course schedule/Moodle for timings.

**Midterms:** It will be an open-book, take-home, group-discussion based exam with one/few applied questions provided to you at least 2 weeks before your Spring Break so that you can submit before the break.

**Inspire talks:** Students (in groups) will make a 15-20 minute presentation on a topic of choice. This will be followed by reflections where we will have an active discussion on each presentation. So, please make sure to write down questions and comments for your peers when they are presenting and don't be shy to bring them up during the discussion. More details on Moodle.

**GRADING (no overlapping due dates for any assignments)**

Assessment	Due	Points (each)
MQs	As given in the schedule	10
Paper responses	As given in the schedule	20
Twitter summary	As given in the schedule	10
Midterms	March 12	50
Inspire Talk	TBD	50

Grade	%
A	94-100
A-	90-93.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	77-79.9
C	73-76.9
C-	70-72.9
D+	67-69.9
D	63-66.9

**Extra Points/Credits for attending/participating in conferences/outside events related to the course (Wildlife Disease) = 5 pts each! While only participation will give you points, you should also write an informal letter to me (not graded) elucidating the key take-home messages from the event/conference.**

**LEARNING ENVIRONMENT AND INCLUSIVITY.**

My goal is to promote an inclusive learning environment where diverse perspectives are recognized, respected, and seen as a source of strength. Part of that effort includes a recognition that all humans have implicit biases, and it is our responsibility to do our best to identify them in ourselves and take actions to mediate them. If something in or about this class makes you feel unwelcome, please see me, your advisor, a professor you trust, or a college administrator.

**Names and pronouns:** You should be addressed in the manner that you prefer. If you want to make sure I address you with a particular name and/or pronoun, please let me know.

**Title IX:** Macalester College is committed to providing a safe learning environment for all students that is free of discrimination, sexual harassment, sexual assault, domestic violence, dating violence, and stalking. Further details are explained in the college's Title IX regulations (<https://www.macalester.edu/titleix>). If you, or someone you know, experiences a Title IX violation, know that Macalester has staff trained to support you. Macalester faculty members are

“responsible employees,” which means that if you tell me about a Title IX violation, I must share that information with the Title IX Coordinator. Still, you will control how your case is handled, including whether you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need (Title IX Office, 651- 696-6258) including, if you wish, confidential sources on campus who are not subject to the mandatory reporting requirement (see list of “Confidential On-Campus Support” at <https://www.macalester.edu/violenceprevention/support/>).

**Accessibility:** I want all students to have fair and equitable access to the learning opportunities in this course. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or to accurate assessment of achievement, please notify me as soon as possible. Students are also welcome to contact the disability service office to discuss a range of options to removing barriers in the course, including accommodations (contact Disability Services, 651-696-6275 or [disabilityservices@macalester.edu](mailto:disabilityservices@macalester.edu)).

Once you have a letter of accommodations, please see me so that we can implement an action plan. Furthermore, I know that at times personal issues, stress, health problems or life circumstances may impact your ability to perform academically. Please contact the Office of Student Affairs at 651-696-6220 ([studentaffairs@macalester.edu](mailto:studentaffairs@macalester.edu)) for support and ask them to get in touch with your instructors.

#### **Other helpful information to support your experience in the class:**

- To address concerns on content or experience in the class, either find me before/after class; attend office hours; or email to set up a time to meet in person.
- If you need additional writing support, please check out *MAX Center* for writing tutors or *Works in Progress* peer review program (Kagin Commons, first floor)
  - You are not able to attend class due to an unexpected event (sickness, family or personal issues) - Contact me as soon as possible to set up a time to talk about options.
  - You are not able to attend class due to religious observance - Please let me know you will be observing ahead of time, so that you can obtain course materials ahead of the absence.
  - If you need an extension on the submission deadlines - Please let me know ahead of the deadline either through email or before/after class or office hours.
- **Do you need time for yourself? Studentship can be overwhelming sometimes, and I want you to take care of yourself. Your wellbeing is of paramount importance and I do not want you to compromise on that, EVER! If you are finding it difficult to follow the scheduling or pace of this course, please let me know.**

All readings, assignment descriptions, and other information about the course will be on Moodle. Moodle will be updated frequently, so please check regularly.

**THIS IS A COURSE TO ‘EDUCATE’ YOU ABOUT WILDLIFE DISEASE ECOLOGY AND NOT LOSE YOUR WAY IN COMPLEX THEORIES, SO PLEASE HAVE FUN WHILE YOU WORK THROUGH THE COURSE! ALSO, A SYLLABUS IS NOT A CONTRACT ---- WE WILL REMAIN FLEXIBLE MUTUALLY**



**WEEKLY COURSE SCHEDULE [Tentative and covering until Week1 of March, we will assess the pandemic situation and move ahead with the next segment of the course]**

WEEK	DAYS	TOPIC		
		Monday	Wednesday	Friday
1	Jan 20-21	Monday N/A	Wednesday	Friday Intro, Ice breaking, who's who [Virtual]
2	Jan 24-28	Intro to Wildlife Disease Ecology [virtual]	What is a Disease? [virtual]	What is a Disease & Disease nomenclature ? [virtual]
3	Jan 31-Feb 4	What Causes Disease? [virtual] Paper 1 uploaded on Moodle	What Causes Disease? [virtual]	From individual to ecosystem: integrative methods for understanding and managing wildlife disease: <b>Dr. Alynn Martin</b> [virtual]
4	Feb 7-Feb 11	<b>Brain Break</b>	How disease is Detected, Described & Measured	Damage, Pathogenicity & Virulence  (Responses for paper 1 due by 5 pm, <b>not graded</b> )
5	Feb 14-Feb 18	Mini-Quiz 1 Mind Games	<i>T. gondii</i> in spotted hyenas: Boldness towards lions and hormonal correlates: <b>Dr. Zachary Laubach</b> [virtual]  Paper 2 uploaded on Moodle	<b>Catch Up session</b>  More Mind Games
6	Feb 21-Feb 25	Pollinator Diseases	Infectious disease ecology of large North American mammals and conservation applications: <b>Dr. Ellen E. Brandell</b> [virtual]	Paper 2 Discussion (Twitter Summary for paper 2 due by 5 pm, <b>not graded</b> )  Migration and Disease
7	Feb 28-Mar 4	Viral ecology of free-living chimpanzees: Implications for life history and conservation: <b>Dr. Jacob Negrey</b> [virtual]	No Class – Students to attend Bio Seminar on March 3 (seminar associated with the course)  Paper 3 uploaded on Moodle	<b>Catch Up session</b>  Rabies and Mumbai Leopards

**Non-compulsory component of the course:**

**One weekend: Trip to International Wolf Center, Ely, MN to understand disease ecology and care of captive wolves**

The dates will be fixed after discussion with students

\*The next segment of the course (March – May) will follow a similar structure with discussion of case studies and papers, guest seminars, and a field trip. However, as mentioned earlier, we will assess the pandemic situation and make adjustments as needed

**Recommended Study Materials:**

While there is no textbook for this course and all reading materials (book chapters/articles) will be made available on Moodle, I recommend the following books for further reading, which I would also be referring to throughout the course:

1. *Wildlife Disease Ecology: linking theory to data and applications* eds. K Wilson, A Fenton, & D Tompkins. Cambridge University Press. British Ecological Society 2019
2. *Essentials of Diseases in Wild Animals*, ed. GA Wobeser, Blackwell Science Limited, 2006

**Land Acknowledgement**

Our college resides on the ancestral homeland of the Dakota people (particularly the Sisseton and Wahpeton bands) who were forcibly exiled from the land in response to aggressive and persistent settler colonialist oppression. We make this acknowledgement to honor the Dakota people, ancestors and descendants; as well as the land itself.

## Covid Considerations

***For your well-being and for the community:*** We are living in unprecedented times, and it is our collective responsibility to ease the stress/trauma that we are facing. There are multiple ways and avenues through which you can get help. Please check this [Campus Resource](#) for information regarding immediate issues.

Please stay back if you are not feeling well, nothing is more important than your health and wellbeing. Also, if you are not feeling well, please stay back for the sake of the community as a whole.

***Help re. absence:*** I will work with you so that you can get all the resources and help you need to make-up for lost lectures/lab. **I generally record all lectures when any student is absent. However, if you cannot attend, it would be really helpful if you could drop me and/or Eleanor a line before class so that I can get the apparatus ready to record the session.** [Help will always be given in my class to those who ask for it and otherwise](#)

***Masks, Vaccines & Boosters:*** As per the mandate of the college and to reduce discomfort to yourself and others, please wear a mask (**I would recommend double masking if you are wearing cloth and/or surgical masks**) when we are indoors. [Please see this NIH article for more details.](#)

Please be kind and sensitive about asking others regarding their comfort levels in shaking hands/hugs

**I am fully vaccinated and boosted, and as per Macalester Mandates, I would recommend you get the booster as well. According to a recent survey, full vaccination reduces chances of hospitalization against covid by ~11% while people with boosters are 46% less likely to be hospitalized**

