

*What, if anything, do medical practitioners need to know about evolution to prevent, diagnose, or treat disease?*

## Syllabus -- Fall 2021

Excluding materials for purchase, syllabus information may be subject to change. The most up-to-date syllabus is located within the course in HuskyCT.

### Course and Instructor Information

**Course Title:** Evolutionary Medicine

**Credits:** 3

**Prerequisites:** None. Genetics and/or Evolution are helpful but not required

**Professor/Instructor/Facilitator:** Dr. Daniel Bolnick

**Pronouns:** [\(he/him/his\)](#)

**Email:** [daniel.bolnick@uconn.edu](mailto:daniel.bolnick@uconn.edu)

**Telephone:** Office phone # 860-486-3156

**Office Hours/Availability:** Thursdays 1-3 PM via WebEx; and by appointment (email if the standard times don't work for you, or approach me before or after class).

**WebEx:** <https://uconn-cmr.webex.com/meet/dab18005> (for attending class virtually, or virtual office hours).

### Course Materials

**Required course materials should be obtained before the first day of class.**

1. Kat Arney. 2020. Rebel Cell: Cancer, Evolution, and the New Science of Life's Oldest Betrayal. Benbella Books.
2. Each lecture will come with one or more original scientific papers will be provided as a free pdf on the course website. I expect that you read the assigned article for the lecture. These are technical articles written by researchers to their peers, and so can be daunting to read. But, these are the go-to source for the actual evidence behind statements. Each week's mini-quiz will feature an extra credit question based on these readings, on material not covered in lecture. Each exam will have an extra credit question based on the readings.
3. We will be using TopHat (<https://tophat.com>) to distribute class materials, lectures, and conduct in- and out-of-class activities, quizzes, discussions, and tests. You can use the Join Code 022266 to join the class, or accept the email invitation that you received. If the TopHat registration fee places an undue financial hardship on you, please talk to me.

Required textbooks (Rebel Cell) are available for purchase through the [UConn Bookstore](#) (or use the Purchase Textbooks tool in HuskyCT). Textbooks can be shipped ([fees apply](#)).

## Assigned scientific articles:

Evolutionary Medicine is an active field of research, with many new articles appearing each week. I reserve the right to substitute readings with more current resources as they are published, though I will not do last-minute substitutions.

*Additional course readings and media are available within TopHat, through either an Internet link or Library Resources*

## Recommended supplemental reading materials:

- For each lecture, the course website provides a zip folder containing many additional articles relevant to the topic. These are readings I found useful in developing lectures, and I provide them for ambitious students who wish to delve more deeply into a particular topic that catches your interest. I do not expect or require that you read these, but they are provided as a resource for you should you choose to go into more depth.
- If you have not previously taken an evolutionary biology class, you may find it helpful to buy and read the short, readable, and cheap: "Evolution, A Very Short Introduction" by Brian & Deborah Charlesworth. This is not required reading, but will be useful for those not already well versed in basic principles of the field.
- Robert Perlman. 2013. Evolution & Medicine. Oxford University Press  
<https://global.oup.com/academic/product/evolution-and-medicine-9780199661725>  
Used copies of this book are widely available online. I used this as a course textbook previously, and you may still find it helpful background reading. However, I found the book both incomplete and it did not follow topics in the order I would prefer, so I have stopped requiring it in favor of scientific articles.

## Course Description

Course Description from Course Catalog: Introduction to evolutionary concepts and hypotheses related to disease and human health, and applications of evolutionary thinking in drug discovery, vaccine design, and development of treatment plans for various diseases.

What does a health-care worker (doctor, nurse, epidemiologist, public health, etc) need to know about evolutionary biology to do their job well? Evolution is often viewed as a purely historical topic disconnected from modern practical concerns. This view is incorrect: evolution plays a key role in many areas of medicine, including vaccine design, antibiotic use, chemotherapy for cancer, drug discovery, personalized medicine, and cultural fads like the paleodiet. This lecture class (supplemented with discussions and problem sets and readings) explores the many ways that understanding human evolution, disease evolution, and cancer evolution, gives us tools to be better health care workers and better patients and citizens.

This class assumes you have a mastery of basic Mendelian and molecular genetics and evolution as taught in a first year biology class or AP class. I do not assume you have had a specialized class on Evolution, but neither is this class a substitute for an Evolution class. We do not cover all core ideas in evolutionary biology from scratch, but rather focus on evolutionary ideas' application to medicine. Basic evolutionary concepts will be reviewed in passing. Should you find that you need a refresher on Genetics, talk to your instructor. Should you need an approachable introduction to basic evolutionary ideas, I recommend reading Brian & Deborah Charlesworth. 2003. Evolution: A very short introduction. Oxford University Press:

<https://global.oup.com/academic/product/evolution-a-very-short-introduction-9780198804369>

This is a good (and very cheap used) general introduction to key ideas in evolutionary biology.

## Course Objectives

By the end of the semester, you should be able to:

1. Explain key evolutionary concepts such as natural selection, genetic drift
2. Interpret phylogenies to evaluate hypotheses about disease origins, spread, and evolution
3. Describe where infectious diseases come from
4. Calculate simple epidemiological functions to estimate rates of disease spread and vaccination rates needed to stop disease.
5. Identify strategies that can be adopted to limit the evolution of antibiotic resistance
6. Predict whether an infectious disease will evolve to become more, or less, virulent
7. Explain how climate change will alter disease prevalence
8. Explain how the origin of multicellular life inevitably gave rise to cancer
9. Identify mutations contributing to cancer origins and spread
10. Select cancer therapy strategies that can constrain tumor evolution
11. Explain why genetic disorders persist despite reducing viability or fertility of affected individuals
12. Evaluate when treating disease symptoms like fever might be counter-productive
13. Describe biological flaws in cultural definitions of race, and how misconceptions about race can lead to medical misdiagnosis.
14. Explain how knowing ancestry does, and does not, guide interpretation of genetic and environmental risk of disease.
15. Skeptically evaluate claims about paleodiet and other claims about how modern environments affect disease risk.
16. Describe how evolutionary principles can guide natural drug discovery
17. Describe how directed evolution can be used to generate new drugs
18. Evaluate when phage therapy may be effective in treating bacterial infections
19. Plan a gene drive strategy to prevent vector transmitted diseases
20. Describe how evolution guides vaccine design
21. Explain the history of eugenics
22. Articulate a personal opinion about modern gene editing technologies.

## Course Outline

Module 1: Evolutionary principles

Module 2: Evolution of infectious disease

Module 3: Evolution of cancer

Module 4: Human evolution and genetic diversity today

Module 5: Evolution as a tool

## Calendar

Date		Topic	Reading	Assignment
Monday	August 30	What, if anything, do medical practitioners need to know about Evolution? An intro to the course	Nesse et al 2010 (optional reading, it is the first day of class after all).	
<b>Basic evolutionary principles</b>				
Wednesday	September 1	An introduction to population genetics	Coop Chapter 1 & 2 for conceptual background. Hedrick 2011 "Population genetics of malaria resistance in humans" illustrates the application of these ideas	
Friday	September 3	Mutation and drift	Coop Chapter 4 Optional: to learn more about mutation rates in humans, read Keightley 2011	
Monday	September 6	Labor Day. No class		
Wednesday	September 8	Phylogenetics	Baladauf 2003. Phylogeny for the faint of heart: a tutorial	Quiz 1
Friday	September 10	Natural Selection	Simonson et al 2010, Genetic evidence for high-altitude adaptation in Tibet. Optional background: Coop chapters 8 & 10	
<b>Evolution of pathogens</b>				
Monday	September 13	Emerging Infectious Diseases: origin	Jones et al 2008, Global trends in emerging infectious diseases	Quiz 2
Wednesday	September 15	Phylogenetics and EIDs	Pybus and Rambaut 2009, Evolutionary analysis of the dynamics of viral infectious disease	
Friday	September 17	Intro to epidemiology	US Department of Health and Human Services, 2012, Principles of Epidemiology in Public Health Practice, page 1.2 through 1.78. Skip self-assessment exercises and shaded boxes.  For optional historical interest, Anderson and May 1979 is the foundation of modern epidemiology	
Monday	September 20	Vaccination	Randolph and Barreiro 2020 Herd Immunity: understanding COVID-19;  Aschwanden 2021, Why herd immunity for COVID is probably impossible	Quiz 3

Wednesd ay	September 22	Evolution of virulence	Geoghegan and Holmes 2018, The phylogenomics of evolving virus virulence	
Friday	September 24	Evolution of immune escape	Rossi et al 2020 Pseudomonas aeruginosa adaptation and evolution in patients with cystic fibrosis	
Monday	September 27	Evolution of drug resistance	Hughes and Andersson 2015, Evolutionary consequences of drug resistance: shared principles across diverse targets and organisms.	Quiz 4
Wednesd ay	September 29	Evolution of vectors	McBride et al 2014, Evolution of mosquito preference for humans linked to an odorant receptor	
Friday	October 1	Fight fire with fire: evolutionary thinking to control diseases	Williams 2009, Darwinian Interventions: taming pathogens through evolutionary ecology	
Monday	October 4	Evolution of COVID	Kupferschmidt 2021, Evolving Threat	Quiz 5 Term paper proposal
<b>Cancer evolution</b>				
Wednesd ay	October 6	The problem with multicellular life	Arney Chapters 1-2	
Friday	October 8	How cancer starts	Arney Chapters 3-4; Zahir et al 2020 Charaterizing the ecological and evolutionary dynamics of cancer	
Monday	October 11	How cancer adapts to its environment	Arney Chapters 5-6; Recommended: pick one of the papers from reading folder 18	Quiz 6
Wednesd ay	October 13	Cancer: adaptive radiation and parallel evolution	Arney Chapters 6-7; Patchett and Woods 2019	
Friday	October 15	Evolution of resistance to chemotherapy	Arney Chapters 8-9	
Monday	October 18	Fight fire with fire: evolutionary thinking to control cancer	Arney Chapters 10-11;  Read et al 2011 The evolution of drug resistance and the curios orthodoxy of aggressive chemotherapy	
Wednesd ay	October 20	Exam 1		Exam 1
<b>Human evolution and disease</b>				
Friday	October 22	Human evolutionary history	Tishkoff and Kidd 2004, Implications of biogeography of human populations for 'race' and medicine;	

Monday	October 25	Macroevolutionary foundations of modern human disease (The problem with tinkering)	Benton et al 2021, The influence of evolutionary history on human health and disease.	
Wednesday	October 27	Evolution of the immune system	Ramos et al 2015, Genetics of autoimmune diseases	
Friday	October 29	Mismatch hypothesis	Corbett et al 2018, The transition to modernity and chronic disease: mismatch and natural selection	
Monday	November 1	Hygiene hypothesis	Zhang et al 2021, Gross ways to live long: parasite worms as an anti-inflammaging therapy?  Scudellari 2017 Cleaning up the hygiene hypothesis	Quiz 7
Wednesday	November 3	Should we treat symptoms of illness?	Blaettis et al 2013, Fever: pathological or physiological, injurious or beneficial?  Also read the introduction and discussion (at least) of Hite and Cressler 2019 Parasite-mediated anorexia and nutrition modulate virulence evolution	
Friday	November 5	Quantitative genetics & GWAS	Coop 2019 Reading tea leaves?  Lewis and Green 2021 Polygenic Risk Scores in the Clinic.  Optional supplemental readings: Hill 2012, Quantitative Genetics in the Genomics Era;  Coop chapters 7 & 8	
Monday	November 8	Birth and maturation	Dance, 2020, Survival of the littlest;  Cant and Johnstone 2008 Reproductive conflict and the separation of reproductive generations in humans	Quiz 8
Wednesday	November 10	Aging and death	Wallace 2005. A mitochondrial paradigm of metabolic and degenerative diseases, aging, and cancer: a dawn for evolutionary medicine	

Friday	November 12	Evolutionary origins of genetic disease	Gurdasani et al 2015, Genomics of disease risk in globally diverse populations	
Monday	November 15	Evolutionary persistence of genetic disease	Withrock et al 2015, Genetic diseases conferring resistance to infectious diseases; Smith et al 2011 Effects of BRCA1 and BRCA2 mutations on female fertility	Quiz 9
Wednesday	November 17	History of Eugenics	Garver and Garver 1991. Eugenics: past, present, and the future; DenHoed 2016 The forgotten lessons of the American Eugenics movement	
Friday	November 19	Neo-Eugenics	Rosenblum 2019, The future of gene editing; Turley et al 2021 Problems with using polygenic scores to select embryos; Wallace 2020 Is it ever morally permissible to select for deafness in one's child?	Term paper outline due
	November 21-27	Thanksgiving Recess		
<b>Evolution as a tool</b>				
Monday	November 29	Ancestry & genetic testing	Mathieson and Scally 2020, What is ancestry? Ledford 2019 Millions affected by racial bias in healthcare algorithm	Quiz 10
Wednesday	December 1	Evolutionary pharmacology	Mawalagedera et al 2019, Combining evolutionary inference and metabolomics to identify plants with medicinal potential	
Friday	December 3	Directed evolution	Davis et al 2017, Directing evolution: the next revolution in drug discovery?	
Monday	December 6	Phage therapy	Kortright et al 2019, Phage therapy: a renewed approach to combat antibiotic-resistant bacteria	Quiz 11
Wednesday	December 8	Vaccine design	Read and Mackinnon 2014, Pathogen evolution in a vaccinated world	

Friday	December 10	Gene drives	Flores and O'Neill 2018, Controlling vector-borne diseases by releasing modified mosquitoes	Term paper due
	December 13-19	Final Exams		

## Course Requirements and Grading

### Summary of Course Grading:

Course Components	Weight
Quizzes	20 %
Midterm	20%
Participation	10%
Term paper	25%
Final Exam	25%

**Quizzes:** To evaluate your ongoing participation and understanding, and identify misconceptions, there will be a brief quiz approximately every week (11 total). Each quiz is worth 2 points, and the lowest score will be dropped. Quizzes will be a mix of multiple choice and fill-in-the-blank and short-answer, and are expected to take less than 15 minutes each (longer accommodations are possible with formal notification). Each quiz will have one bonus question based on optional supplemental readings from the scientific literature, to reward those who go above and beyond expectations. Because the lowest score is not counted towards your final grade, no make-up quizzes will be given. Quizzes will be implemented online and taken at a time of your choice on the day it is due. I require that you do not discuss the quiz with anyone while taking the quiz, and for at least 24 hours afterwards.

**Midterm exam:** One 50-minute exam based on material in the first half of the course, including lecture contents and readings. The test will consist of a combination of short-answer and multiple choice questions. I prefer essay exams, but due to budget cuts I no longer have a TA for this class so must be a bit more economical with my assessments. The exam will include a bonus question (extra credit) drawn from reading material not covered in class.

**Participation:** After some lectures you will be prompted to provide brief reflections on the topic of the day. These should take you no more than 5 minutes. These reflections will vary from class to class, but typically will ask you to (1) identify one especially interesting idea you learned that was unfamiliar, (2) articulate one question, or (3) find and describe a new example that illustrates a topic covered in class. The participation grade comes from regular engagement in these discussions, and attendance.

#### **Term paper:**

A 10-page (double-spaced) research paper, due the last day of class. Students should use this paper as an opportunity to learn more detail about a particular topic in evolutionary medicine, and summarize what is known about this topic, including detailed descriptions of scientific evidence and examples. Details will be provided in a separate document. Students should submit a brief (100 word) proposal with at least 3 references for approval. You will be encouraged to trade drafts with a fellow student for feedback and revision before final submission.

**Final exam:** A 120-minute test based on material in the first half of the course, including lecture contents and textbook readings. The test will consist of a combination of short-answer and multiple choice questions, plus written-response questions. Students are required to be available for their exam during the stated time. If you have a conflict with this time, you must visit the Dean of Students Office to discuss the possibility of rescheduling this exam. Please note that vacations, previously purchased tickets or reservations, social



events, misreading the exam schedule and over-sleeping are not viable excuses for missing a final exam. If you think that your situation warrants permission to reschedule, please contact the Dean of Students Office with any questions. Thank you in advance for your cooperation.

**Make-up work / missed exams:** No make-up credit is given for missed quizzes (see above, though exceptions may be granted in unusual circumstances at the discretion of the instructor). Any student who misses an exam or quiz without advance permission will receive a 0 for the exam. Permission to miss an exam requires, but is not guaranteed by, verifiable written documentation of the reason. A student who receives permission to miss an exam will either take a make-up exam or have his or her grade for the missed work prorated based on his or her performance on the remainder of the exam and quizzes. Every student must take the final exam during the scheduled final exam period unless permission to reschedule is obtained through the Dean of Students Office: <http://www.dos.uconn.edu>

### Grading Scale:

Grade	Letter Grade	GPA
93-100	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
<60	F	0.0

### Due Dates and Late Policy

All course due dates are identified in the Calendar above. Assignments are due by midnight on the listed day, Eastern Time US, unless specified otherwise. *The instructor reserves the right to change dates accordingly as the semester progresses. All changes will be communicated in an appropriate manner.*

You may, within reason, ask your instructor for leeway on a due date, but this must be well justified and is not guaranteed. Late submissions that did not receive prior approval will be penalized 10% per day.

### Feedback and Grades

I will make every effort to provide feedback and grades within one week. To keep track of your performance in the course, refer to My Grades in TopHat.

### Weekly Time Commitment

You should expect to dedicate 3 hours a week to class attendance, plus 6 hours per week at home for reading, assignments, quizzes, and online discussions. This expectation is based on the [University of Connecticut's policy regarding credit hours](#). (More information related to hours per week per credit can be accessed at the [Online Student website](#)).

### Assessment/Exam Proctoring

Quizzes and exams will be given in TopHat. These will be closed book, honor system. I will not video

monitor you during these assessments, as this is overly intrusive. I expect you to adhere to rules of Academic Integrity and any failure in this regard will result in a final grade of zero and a report to the University. You may not consult with notes, course materials, or other people when taking online quizzes or tests.

Plagiarism and cheating are violations of the student conduct code, and may be punished by failure in the course or, in severe cases, dismissal from the University. For more information, see Appendix A of the Student Conduct Code:

<http://community.uconn.edu/the-student-code-appendix-a/>

## How to Succeed in this Course

All students can succeed in this course and we are here to help you along the way. Please do not hesitate to ask questions or attend office hours. All questions are important here. Success in this course program depends heavily on your personal health and well-being. Recognize that stress is an expected part of the college experience, and it often can be compounded by unexpected setbacks or life changes outside the classroom. Your teaching assistants and I strongly encourage you to reframe challenges as an unavoidable pathway to success. Reflect on your role in taking care of yourself throughout the semester, before the demands of exams and projects reach their peak. Please feel free to reach out to me about any difficulty you may be having that may impact your performance in your courses or campus life as soon as it occurs and before it becomes too overwhelming. In addition to your academic advisor, I strongly encourage you to contact the many other support services on campus that stand ready to assist you.

Consider including links to the [Dean of Students Office](#), [Academic Achievement Center](#), [Writing Center](#), [Quantitative Learning Center](#), [Center for Students with Disabilities](#), [Title IX Office](#), [Student Health and Wellness -- Mental Health](#), etc.

To succeed, I expect you to gain a mastery first of the core concepts of evolution, including natural selection, basic population genetics, and phylogenetics. Second, you should be able to answer the question posed at the top of this syllabus: in what ways does knowing evolution impact medical practice? You should be able to articulate a list of answers to this question, illustrated with specific case studies (genes, pathogens, etc). Knowing specific examples gives you the capacity to explain the ideas in concrete ways.

There is mathematics in this class, including simple algebra, probability, statistics, and simple differential equations. I will endeavor to explain this math in an approachable manner that does not presume you have specific knowledge from prior classes. I will not shy away from this mathematics, because many areas of biology are fundamentally based on mathematics, and it is a disservice to you to teach you the biology without its mathematical backbone. Seek instructor or peer help if you are struggling with the math.

## Husky Study Groups

Are you interested in forming a study group with other students in the class? Don't know other students? There is a study group application in Nexus that can help you get started. If interested, see this [video](#) ([https://nexus.uconn.edu/secure\\_per/studygroups/video.php](https://nexus.uconn.edu/secure_per/studygroups/video.php)) and go [here](#) ([https://nexus.uconn.edu/secure\\_per/studygroups/index.php](https://nexus.uconn.edu/secure_per/studygroups/index.php)) for more information.

## Resources for Students Experiencing Distress

The University of Connecticut is committed to supporting students in their mental health, their psychological and social well-being, and their connection to their academic experience and overall wellness. The university believes that academic, personal, and professional development can flourish only when each member of our community is assured equitable access to mental health services. The university aims to make access to mental health attainable while fostering a community reflecting equity and diversity and understands that good mental health may lead to personal and professional growth, greater self-awareness, increased social engagement, enhanced academic success, and campus and community involvement.

Students who feel they may benefit from speaking with a mental health professional can find support and resources through the [Student Health and Wellness-Mental Health](#) (SHaW-MH) office. Through SHaW-MH, students can make an appointment with a mental health professional and engage in confidential conversations or seek recommendations or referrals for any mental health or psychological concern.

Mental health services are included as part of the university's student health insurance plan and also partially funded through university fees. If you do not have UConn's student health insurance plan, most major insurance plans are also accepted. Students can visit the **Student Health and Wellness-Mental Health located in Storrs on the main campus in the Arjona Building, 4th Floor**, or contact the office at **(860) 486-4705**, or <https://studenthealth.uconn.edu/> for services or questions.

## Accommodations for Illness or Extended Absences

Please stay home if you are feeling ill and please go home if you are in class and start to feel ill. If illness prevents you from attending class, it is your responsibility to notify your instructor as soon as possible. You do not need to disclose the nature of your illness, however, you will need to work with your instructor to determine how you will complete coursework during your absence.

If life circumstances are affecting your ability to focus on courses and your UConn experience, students can email the Dean of Students at [dos@uconn.edu](mailto:dos@uconn.edu) to request support. Regional campus students should email the Student Services staff at their home campus to request support and faculty notification.

COVID-19 Specific Information: People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. These symptoms may appear 2-14 days after exposure to the virus and can include:

- Fever,
- Cough,
- Shortness of breath or difficulty breathing
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

Additional information including what to do if you test positive or you are informed through contact tracing that you were in contact with someone who tested positive, and answers to other important questions can be found here: <https://studenthealth.uconn.edu/updates-events/coronavirus/>

## COVID Policy

Masks are required for in-person lecture. If you are medically unable to attend lectures in person contact the instructor to discuss options for recordings.

The rules for attending are:

- i) Do not attend if you:
  - a. have any symptoms associated with COVID including fever, headache, gastrointestinal distress, loss of smell or taste, cough
  - b. Know you have been in close proximity to someone with the above symptoms, or with a positive COVID test, in the past two weeks.
- ii) If you attend you should:
  - a. Sit as far from other students as practical
  - b. Wear a mask at all times
  - c. Wash your hands before and after entering the room
  - d. No eating or drinking in the classroom.

Masks will be mandatory for all in-person meetings and events.

Vaccination is the best protection for yourself, and for others around you. The university requires COVID vaccination for in-person classes, but does grant waivers. If you have a waiver, I would encourage you to attend remotely for your own safety and to respect others. I have a 10-year old child who cannot yet be vaccinated (we are eagerly awaiting approvals for younger kids) and I have no wish to be the vehicle for a break through case that spreads to her. Please please please be vaccinated.

### **Classroom/Virtual Classroom Guidelines**

#### **THIS CLASS TOUCHES ON EMOTIONALLY CHARGED TOPICS**

Students taking this class should be aware that lectures and discussions will touch on difficult topics that may be personally distressing. We will discuss diseases that may have impacted you or members of your family or friends, including cancer and the ongoing SARS-Cov2. This may include disturbing images of medical conditions in lecture. Be sensitive to the fact that some of your peers may have dealt with some of these medical conditions in their family, among friends, or personally. Therefore, it is imperative that all discussions in class and online should be conducted in a respectful and sensitive manner.

We will discuss the politically difficult topic of human biological diversity. We will discuss how culture and history shape perceptions of race, and how biological diversity among people fails to match our society's definitions of race. We will discuss the history of racism in biology and its connection to the Holocaust in Germany and forced sterilization programs in the United States. Students should be prepared to approach the topics in this class with an open mind, an inquisitive and skeptical attitude, and a polite respect for others' opinions. If you have concerns about a particular topic being stressful to discuss, please discuss your concerns with the instructor or TA.

This class concerns evolution, past present and future. Some students find this topic challenging for cultural and religious reasons. Regardless of your religious views, I expect you to engage seriously with the ideas and evidence concerning evolution and medicine, and be able to articulate the views of the scientific community. I do not expect you to abandon or change your religious views, and emphasize that many past and present theologians, priests, and scientists have found ways to reconcile their understanding of biology and evolution with their religious beliefs.

Students who engage in disrespectful or disruptive dialogue in class will be asked to leave.

**Additional, university-wide course policies can be found here:**

<http://provost.uconn.edu/syllabi-references/>

## **Student Responsibilities and Resources**

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important [standards, policies and resources](#), which include:

- The Student Code
  - Academic Integrity
  - Resources on Avoiding Cheating and Plagiarism
- Copyrighted Materials
- Credit Hours and Workload
- Netiquette and Communication
- Adding or Dropping a Course
- Academic Calendar
- Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
- Sexual Assault Reporting Policy

## **Students with Disabilities**

The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or <http://csd.uconn.edu/>.

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government.” (Retrieved March 24, 2013 from [Blackboard's website](#))

## **Software/Technical Requirements (with Accessibility and Privacy Information)**

The software/technical requirements for this course include:

- TopHat
- HuskyCT/Blackboard ([HuskyCT/ Blackboard Accessibility Statement](#), [HuskyCT/ Blackboard Privacy Policy](#))
- [Adobe Acrobat Reader](#) ([Adobe Reader Accessibility Statement](#), [Adobe Reader Privacy Policy](#))
- Google Apps ([Google Apps Accessibility](#), [Google for Education Privacy Policy](#))
- Microsoft Office (free to UConn students through [uconn.onthehub.com](http://uconn.onthehub.com)) ([Microsoft Accessibility Statement](#), [Microsoft Privacy Statement](#))
- Dedicated access to high-speed internet with a minimum speed of 1.5 Mbps (4 Mbps or higher is recommended).
- WebCam (if attending remotely)

For information on managing your privacy at the University of Connecticut, visit the [University's Privacy page](#).

**NOTE:** This course has NOT been designed for use with mobile devices.

**NOTE:** If you require closed captioning, inform the instructor.

## FERPA Reminder – Posting Student Photos and Videos

Some videos of in-class material may be recorded for subsequent reviewing.

Given the increase in remote teaching, we want to help clarify when sharing photos or videos of students may be permissible. The US Department of Education has issued [guidance](#) around this matter.

In general, a photo or video is considered an education record when it *directly* relates to the student (rather than just incidentally related to him or her). This means that when a student is the intended focus of the photo or video and the content is maintained by an instructor in connection with their role at UConn, it is likely considered an education record. In this context, a student photo or video should not be released to anyone other than the student, unless prior written consent is obtained.

If however, an instructor records a course lecture that captures student participation, any visual representations of the students in this context are likely not educational records; the student is generally not the intended focus of the recording. You may share the recording with the appropriate class so long as you do so via University protected resources (e.g. HuskyCT).

NEVER share student or class information, including videos and photos, on public social media platforms. Please keep in mind that each case is context specific, but that in general you should err on the side of caution; if you are uncertain if your actions are permissible under FERPA, please ask first. You may learn more about the University's FERPA Policy at <https://policy.uconn.edu/2011/05/24/ferpa-policy/>. For more information, contact: Laurie Neal at [privacy@uconn.edu](mailto:privacy@uconn.edu)

The University of Connecticut is required by federal law to verify the identity of students who participate in online courses and to establish that students who register in an online course are the same students who participate in and complete the course activities and assessments and receive academic credit. Towards this end, I am supposed to require that you have your camera on during class time. I believe such requirements are an invasion of student privacy so this requirement will not be enforced (e.g., your camera might be on but accidentally covered by tape). However, I will also point out that showing your face in virtual class is helpful to your instructor (in gauging student responses) and your peers in maintaining a sense of social connectedness (you may of course use a virtual background). Pets are welcome.

### Respect the Privacy of Your Peers and Instructor:

Some forums ask students to share personal information, relevant to the topic at hand. Do not share your peer's personal information - respect their privacy. This privacy extends to all of your classmates' presence in the online class environment. Sharing screenshots, video, or audio of your classmates without their permission is a violation of student privacy rights. Similarly, you should not share any of your classmate's classwork, group work, presentations or other educational materials without permission.

### Course material copyright

My lectures, notes, handouts, and displays are protected by state common law and federal copyright law. They are my own original expression and I've recorded them prior or during my lecture in order to ensure that I obtain copyright protection. Students are authorized to take notes in my class; however, this authorization extends only to making one set of notes for your own personal use and no other use. I will inform you as to whether you are authorized to record my lectures at the beginning of each semester. If you are so authorized to record my lectures, you may not copy this recording or any other material, provide copies of either to anyone else, or make a commercial use of them without prior permission from me.

## Help

[Technical and Academic Help](#) provides a guide to technical and academic assistance.

This course uses the learning management platform, [HuskyCT](#). If you have difficulty accessing HuskyCT, you have access to the in person/live person support options available during regular business hours through the [Help Center](#). You also have [24x7 Course Support](#) including access to live chat, phone, and

support documents.

## **Student Technology Training**

Student technology training is now available in a new HuskyCT short course created by students for students. It will prepare you to use the IT systems and services that you will use throughout your time at UConn, whether learning online or on-campus. It is available at [https://lms.uconn.edu/ultra/courses/\\_80016\\_1/cl/outline](https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline) .

## **Minimum Technical Skills**

To be successful in this course, you will need the following technical skills:

- Use electronic mail with attachments.
- Save files in commonly used word processing program formats.
- Copy and paste text, graphics or hyperlinks.
- Work within two or more browser windows simultaneously.
- Open and access PDF files.

University students are expected to demonstrate competency in Computer Technology. Explore the [Computer Technology Competencies](#) page for more information..

## **Evaluation of Course Experience**

Students will be given an opportunity to provide feedback on their course experience and instruction using the University's standard procedures, which are administered by the [Office of Institutional Research and Effectiveness](#) (OIRE).

The University of Connecticut is dedicated to supporting and enhancing teaching effectiveness and student learning using a variety of methods. The Student Evaluation of Teaching (SET) is just one tool used to help faculty enhance their teaching. The SET is used for both formative (self-improvement) and summative (evaluation) purposes.

Additional informal formative surveys and other feedback instruments may be administered within the course.

## Recommended Supplementary Popular Science Books for Motivated Students

Robert Pearlman, 2013 *Evolution & Medicine*

Randolph Nesse and George Williams. 1996. *Why We Get Sick: The New Science of Darwinian Medicine*. Vintage Press. This book kicked off the subject of evolutionary medicine. I list it because it is brief and well-written and of historical interest, although the content is largely supplanted by our required text

Athena Aktipis. 2020. *The Cheating Cell: How evolution helps us understand and treat cancer*. Princeton University Press.

Carl Zimmer. *She Has Her Mother's Laugh*. Dutton Press; 2018. This book is an outstanding and extensive overview of human genetics, written for a general audience.

Ed Yong. *I Contain Multitudes*. Ecco Press; 2018. Want to know more about the beneficial microbes inside you, and the many ways they affect your health?

Neil Shubin, *Your Inner Fish: A journey into the 3.5 billion-year history of the human body*. Vintage Press; 2009. A paleontological and developmental biology perspective on the deep-time origins of many of our bodies' traits. You can also see the excellent 3-part documentary based on this book, here: <https://www.pbs.org/your-inner-fish/watch/>

Daniel Lieberman, *The Story of the Human Body: Evolution, Health, and Disease*. Vintage Press 2014. A detailed foray into human evolution.

Each lecture has required reading material, and many have recommended readings that will help you with extra credit questions. I also provide a folder of related readings containing many pdfs of scientific articles on a topic for a given day. If you find a topic especially interesting, or if you are pursuing a research paper on a given topic, you may find these useful.