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## **Term Information**

Effective Term Autumn 2026

## **General Information**

Course Bulletin Listing/Subject Area Biology  
Fiscal Unit/Academic Org Introductory Biology - D0326  
College/Academic Group Arts and Sciences  
Level/Career Undergraduate  
Course Number/Catalog 3730  
Course Title Humans vs Germs: An Arms Race between Medicine and Evolution  
Transcript Abbreviation Humans vs Germs  
Course Description An evolutionary analysis of human health through the lens of our coevolution with pathogens and the rise of biotechnology as a tool for manipulating how evolution affects both pathogens and the human condition.  
Semester Credit Hours/Units Fixed: 3

## **Offering Information**

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week  
Flexibly Scheduled Course Never  
Does any section of this course have a distance education component? No  
Grading Basis Letter Grade  
Repeatable No  
Course Components Lecture  
Grade Roster Component Lecture  
Credit Available by Exam No  
Admission Condition Course No  
Off Campus Never  
Campus of Offering Columbus, Lima, Mansfield, Marion, Newark, Wooster

## **Prerequisites and Exclusions**

Prerequisites/Corequisites Biology 1101 or 1110 or 1113xx (1113.xx, 1113H, or 1113E) and 1114xx (1114.xx, 1114H, or 1114E)  
Exclusions  
Electronically Enforced Yes

## **Cross-Listings**

Cross-Listings

## **Subject/CIP Code**

Subject/CIP Code 26.1310  
Subsidy Level Baccalaureate Course  
Intended Rank Sophomore, Junior, Senior

## Requirement/Elective Designation

Origins and Evolution

The course is an elective (for this or other units) or is a service course for other units

## Course Details

### **Course goals or learning objectives/outcomes**

- Explain how evolutionary processes like mutation, drift, natural selection, and sexual selection can help us understand the ultimate causes of disease;
- Apply the tools of evolutionary biology to biomedical problems, such as pathogen evolution
- Analyze human health problems and identify whether and how an evolutionary perspective can help with understanding the causes and/or treatment of disease and the development of therapeutics
- Apply an understanding of evolutionary processes to predict the response of humans and their parasites to changes in the environment
- Analyze the effects of various biotechnological innovations on human health and pathogen evolution
- Effectively communicate complicated scientific ideas using both written and oral modalities

### **Content Topic List**

- Evolutionary medicine
  - evolutionary mechanisms
  - cancer biology
  - pathogen coevolution
  - biotechnology
  - vaccines
- Yes

### **Sought Concurrence**

## Attachments

- Biology 3730 Syllabus.pdf  
*(Syllabus. Owner: Andrews, Adam Lee)*
- Biology 3730 Concurrence Request List.docx  
*(List of Depts Concurrence Requested From. Owner: Andrews, Adam Lee)*
- 3730 History Concurrence.pdf  
*(Concurrence. Owner: Andrews, Adam Lee)*
- 3730 Micro Concurrence.pdf  
*(Concurrence. Owner: Andrews, Adam Lee)*
- 3730 Pharmacy Concurrence.pdf  
*(Concurrence. Owner: Andrews, Adam Lee)*
- Biology 3730 GE Form.pdf: GE Summary Form  
*(Other Supporting Documentation. Owner: Andrews, Adam Lee)*

## Comments

- needs prereq adjustment *(by Kulesza, Amy Elizabeth on 04/30/2025 08:56 AM)*

**COURSE REQUEST**  
3730 - Status: PENDING

Last Updated: Vankeerbergen, Bernadette  
Chantal  
04/30/2025

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Andrews, Adam Lee	04/30/2025 08:40 AM	Submitted for Approval
Revision Requested	Kulesza, Amy Elizabeth	04/30/2025 08:56 AM	Unit Approval
Submitted	Andrews, Adam Lee	04/30/2025 08:57 AM	Submitted for Approval
Approved	Kulesza, Amy Elizabeth	04/30/2025 09:34 AM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	04/30/2025 03:29 PM	College Approval
Pending Approval	Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Neff, Jennifer Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	04/30/2025 03:29 PM	ASCCAO Approval



THE OHIO STATE UNIVERSITY

**Biology 3730**

***Humans vs Germs:***

***An Arms Race between Medicine and Evolution***

**Spring 2026 – 3 Credit Hours**

**Lecturer:**

**Email:**

**Office:**

**Student Hours:**

*other times scheduled by appointment*

**Course Coordinator:**

*Center for Life Sciences Education*

**Email:**

**Office:**

**Phone:**

**Class Meeting Schedule:**

**Lecture:** Twice Weekly for 80 minutes

**Prerequisites:**

Biology 1101, 1110, or 1113xx and 1114xx

**Required Course Materials:**

There will be no textbook for this course. Students can expect regular reading assignments from the primary and secondary literature, which will be linked on Carmen.

**Credit Hours and Work Expectation:**

This is a 3-credit-hour course. According to Ohio State policy, students should expect around 3 hours per week of time spent on direct instruction in addition to 6 hours of homework to receive a grade of C average. [ASC Honors](#) provides an excellent guide to scheduling and study expectations.

**Course Description:**

An evolutionary analysis of human health through the lens of our coevolution with pathogens and the rise of biotechnology as a tool for manipulating how evolution affects both pathogens and the human condition.

**Course Description and Learning Goals**

**This course fulfills the Goals and Outcomes for the General Education *Origins and Evolution* Theme.**

Theme: Origins and Evolution	
Goals	Expected Learning Outcomes
1. Analyze Origins & Evolution at a more advanced and in-depth level than in the Foundations component.	<b>Successful students will be able to ...</b>
	<b>1.1</b> Engage in critical and logical thinking about the topic or idea of origins and evolution. <b>1.2</b> Conduct an advanced, in-depth, scholarly exploration of the topic or idea of origins and

	evolution.
2. Integrate approaches to understanding the issues involved in origins and evolution by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in the future.	<b>2.1</b> Identify, describe, and synthesize approaches or experiences as they apply to origins and evolution.
	<b>2.2</b> Demonstrate a developing sense of self as a learner through reflection, self-assessment and creative work, building on prior experiences to respond to new and challenging contexts.
3. Appreciate the time depth of the origins and evolution of natural systems, life, humanity, or human culture, and the factors that have shaped them over time.	<b>3.1</b> Illustrate their knowledge of the time depth of the universe, physical systems, life on earth, humanity or human culture by providing examples or models.
	<b>3.2</b> Explain scientific methods used to reconstruct the history of the universe, physical systems, life on earth, humanity or human culture and specify their domains of validity.
	<b>3.3</b> Engage with current controversies and problems related to origins and evolution questions.
4. Understand the origins and evolution of natural systems, life, humanity, or human culture, and the factors that have shaped them over time.	<b>4.1</b> Describe their knowledge of how the universe, physical systems, life on Earth, humanity or human culture have evolved over time.
	<b>4.2</b> Summarize current theories of the origins and evolution of the universe, physical systems, life on earth, humanity or human culture.

Students in Biology 3730 will explore what evolution has to teach us about human health and origins of disease in the rapidly growing field of evolutionary medicine. While biomedical science has identified many of the proximate biochemical, physiological, and immunological mechanisms that underlie disease, the ultimate explanations for why we get sick are intimately tied to both our evolutionary history and the evolutionary histories of our parasites and pathogens. This course will expand on foundational principles of evolution and genetics to students with an evolutionary perspective on human health and the origins of disease, showing how a consideration of features of the evolutionary process can provide a complementary approach to the study of disease, helping to solve many of the complex health problems facing humans today by understanding how they arise and how humans can use biotechnology to influence evolution.

## Course Learning Goals

Successful students in this course will be able to:

- Explain how evolutionary processes like mutation, drift, natural selection, and sexual selection can help us understand the ultimate causes of disease;
- Apply the tools of evolutionary biology to biomedical problems, such as pathogen evolution;
- Analyze human health problems and identify whether and how an evolutionary perspective can help with understanding the causes and/or treatment of disease and the development of therapeutics;
- Apply an understanding of evolutionary processes to predict the response of humans and their parasites to changes in the environment;
- Analyze the effects of various biotechnological innovations on human health and pathogen evolution;
- Effectively communicate complicated scientific ideas using both written and oral modalities.

## Grading and Evaluation:

Graded assignments may come in three forms, and students should note the expectations for each in the descriptions of our class assignments below:

- **Independent Work (↑)**: Strictly non-collaborative, original-individual work. You may discuss this assignment only with your instructor. Discussions with other individuals, either in person or electronically, are strictly prohibited and constitute academic misconduct.
- **Required Collaboration (↑↑↑)**: An explicit expectation for collaboration among students either in-class or outside (i.e., group work).
- **Optional Collaboration (↑↑)**: Students are permitted, but not required, to discuss the assignment or ideas with each other. However, all submitted work must be one's original and individual creation.

Assignment	Points	Assignment Type
Reading Reflection (9x10 points each)	90	↑
In-Class Activities	75	↑ ↑↑ ↑↑↑
Essay Exams (3 x 75)	225	↑
Synthetic Review Article	200	↑
SALG	5	↑
<b>Total Points Possible</b>	<b>595</b>	

## Reading Reflections (90 points)

Prior to each class, students will read articles from the primary literature as assigned in the course schedule and available on Carmen.

**You are required to submit a response to the daily reading by 11:59pm the night before class (see assigned dates on the schedule and Carmen).** These responses should do three things:

- (1) *Highlight the result obtained or question provoked by the study* that you found most surprising, interesting, or otherwise compelling. You should include an explanation of how the authors came to that result or question and explain why you found it compelling. This is an excellent way to demonstrate that you read the article carefully and thought about it.

- (2) *Propose one question that can be used to stimulate discussion.* Discussion questions should not address purely technical or methodological questions (see below). They should be open-ended questions that need not have a right or wrong answer, but should be answerable by other students (that is, don't write questions that you think only the instructor can answer).
- (3) *Address technical or methodological questions.* These questions can be purely for clarification and comprehension, that is, they can have right or wrong answers. Note that a question about whether a particular experiment or method is actually appropriate for answering the study question is more of a discussion question.

Each of these responses will be assessed on a simple 3 point scale (9 points total per reflection): thoughtful responses that demonstrate clearly that you read the articles and thought about them will receive full credit; partial credit will be awarded to responses that are complete but superficial; no points will be awarded if the questions are missing or could have been written based only on reading the abstract. *The lowest score will be dropped.*

### **In-Class Activities (75 points)**

Throughout the lectures, participation will be encouraged and assessed through a range of active learning activities, which may include TopHat questions, case-studies, worksheets, etc. Some will be completed individually while others will require discussion and engagement with other students in the class. More than 75 points will be available in order to accommodate absences.

### **Essay Exams (225 points)**

One week prior to the scheduled exam, students will be provided with three essay prompts that they may prepare answers to. On the day of the exam, the instructors will choose one of the prompts for which students will provide a written response in class. The essay topics will draw in the lecture presentations and reading assignments.

### **Synthetic Review Article (200 points)**

The final project for this course will be a **3000-word synthetic review of the evolutionary considerations of any human health condition or other topic in evolutionary medicine**. The review must synthesize the current state of scientific knowledge in the topic, with at least 10 references, at least 7 of which must be from the primary literature. Don't be constrained to only thinking about infectious disease, as there are evolutionary factors that help explain our susceptibility to chronic diseases (obesity, mental illness, etc.) as well.

- **Topic statement (10 points):** You must submit a topic statement based on a provided list of potential topics.
- **Annotated bibliography (40 points):** You are required to submit an annotated bibliography that identifies 12 articles that will be used in the synthetic review. At least 10 of these articles must be from the primary literature. In addition to providing a properly formatted citation, you must provide a three-sentence summary of the article that identifies the key result of the study and explains how the study fits into the theme of the review.
- **Rough draft (50 points):** A detailed rubric will be posted to Carmen that details

how the final draft will be evaluated. Feedback will be provided that must be addressed in the final draft of the paper.

- **Final draft (100 points)**

### **Your Final Grade:**

Your final grade will be based on the percentage of the 595 points that you earn during the course of the semester as described above. Please note that we do not grade the course on a curve and Carmen does not round averages up to the next nearest percentage point, so 92.11% and 92.97% both earn the grade of A-. Final letter grades will be determined by the grade scale below:

### **Grade Scale:**

A	A-	B+	B	B-	C+	C	C-	D+	D	E
100 – 93.0%	92.9 – 90.0%	89.9 – 87.0%	86.9 – 83.0%	82.9 – 80.0%	79.9 – 77.0%	76.9 – 73.0%	72.9 – 70.0%	69.9 – 67.0%	66.9 – 60.0%	59.9 – 0%

### **Posting of Grades:**

All grades will be posted on Carmen. After grades are posted you have 10 working days to challenge any grade or inquire regarding an unposted or missing grade. **After that time, grades are final.** To challenge or inquire about a missing grade, contact your laboratory instructor.

### **\*\*IMPORTANT\*\***

*Make sure that all of your grades are properly posted on Carmen as you receive them. Challenges about grades, particularly after the end of the semester, will not be entertained after the 10-day grace period.*

### **Late Assignments:**

All assignments are due on the date and time prescribed in the course schedule. Late work will not be accepted except in rare (and documentable) circumstances.

### **Absences:**

#### Exams:

If you are too ill to take an exam or must miss for another legitimate unscheduled reason, you must contact the Course Coordinator within 24 hours of the exam. Make up exams will be given only to students who produce, at the make up or before, documentation of a legitimate reason (at the time of the absence) for missing the exam. Valid excuses are limited to problems that are beyond the student's control, such as military duty, intercollegiate athletic or academic activities, funerals, etc. Medical excuses will be considered only if you have been treated by a medical professional on the day of the exam (excuses from the student health center website will not be accepted). Lack of transportation, loss of electricity, travel plans, etc. are not considered valid excuses. If you anticipate having to miss an exam due to attendance at a university sanctioned event or other qualifying conflict, you must contact the Course Coordinator at least one week in advance of the exam.

If you have no documentation to support your absence, or your absence from the exam is not for an excused reason, you will still be offered the opportunity for a makeup exam, with a 25% overall deduction on your exam score if arrangements are made within 24 hours of the original exam. The format of makeup exams is at the discretion of the instructors.

**Note: Check the date and time of the final examination now and make sure that this time does not**



conflict with your future plans. No early final exams will be given. The only makeup exam will be held on [TBD] at 9:00 a.m. and is available only in emergency situations and with prior approval of the Course Coordinator.

### **Disability Services:**

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let the Course Coordinator know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements with the Course Coordinator as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. Only the course coordinator is authorized to complete SLDS accommodations. This will help us ensure that your individual needs will be met appropriately and fairly.

If you are ill and need to miss class, including if you are staying home and away from others while experiencing symptoms of a viral infection or fever, please let your instructor know immediately. In cases where illness interacts with an underlying medical condition, please consult with Student Life Disability Services to request reasonable accommodations. You can connect with them at [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; or [slds.osu.edu](http://slds.osu.edu).

### **Religious Accommodations:**

Ohio State has had a longstanding practice of making reasonable academic accommodations for students' religious beliefs and practices in accordance with applicable law. In 2023, Ohio State updated its practice to align with new state legislation. Under this new provision, students must be in early communication with their instructors regarding any known accommodation requests for religious beliefs and practices, providing notice of specific dates for which they request alternative accommodations within 14 days after the first instructional day of the course. Instructors in turn shall not question the sincerity of a student's religious or spiritual belief system in reviewing such requests and shall keep requests for accommodations confidential.

With sufficient notice, instructors will provide students with reasonable alternative accommodations with regard to examinations and other academic requirements with respect to students' sincerely held religious beliefs and practices by allowing up to three absences each semester for the student to attend or participate in religious activities. Examples of religious accommodations can include, but are not limited to, rescheduling an exam, altering the time of a student's presentation, allowing make-up assignments to substitute for missed class work, or flexibility in due dates or research responsibilities. If concerns arise

about a requested accommodation, instructors are to consult their tenure initiating unit head for assistance.

A student's request for time off shall be provided if the student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement and the student has notified their instructor, in writing during the first 14 days after the course begins, of the date of each absence. Although students are required to provide notice within the first 14 days after a course begins, instructors are strongly encouraged to work with the student to provide a reasonable accommodation if a request is made outside the notice period. A student may not be penalized for an absence approved under this policy.

If students have questions or disputes related to academic accommodations, they should contact their course instructor, and then their department or college office. For questions or to report discrimination or harassment based on religion, individuals should contact the **Office of Institutional Equity**.

Policy: **Religious Holidays, Holy Days and Observances**

#### **Weather or Other Short-Term Closing:**

Should in-person classes be canceled, students will be notified as to which alternative methods of teaching will be offered to ensure continuity of instruction for this class. Communication will be via Carmen announcements and course-wide email.

#### **Instructor Feedback and Response Expectations:**

- **Email response:** The CLSE's expectation of instructors is that emails will be responded to within one business day. If your email is sent during the evening or over the weekend, you may not receive a response until the next business day.
- **Class announcements:** I will send important class-wide messages through the Announcements tool in Carmen. Please check [your notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Graded assignments:** Assignments will be graded and returned to you within one week after they were due. All scores are posted on Carmen no later than the day the graded assignment is returned.

#### **Course Technology:**

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** [8help@osu.edu](mailto:8help@osu.edu)
- **TDD:** 614-688-8743

#### ***Carmen***

- Carmen, Ohio State's Learning Management System, will be used to host materials and activities throughout this course. To access Carmen, visit [Carmen.osu.edu](https://carmen.osu.edu). Log in to Carmen using your name.# and password. If you have not setup a name.# and password, visit [my.osu.edu](https://my.osu.edu).
- Help guides on the use of Carmen can be found at <https://resourcecenter.odee.osu.edu/carmen>

- **This online course requires use of Carmen (Ohio State’s learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.**
- [Carmen accessibility](#)

#### **CarmenZoom**

- Office hours will be held through Ohio State’s conferencing platform, CarmenZoom. A separate guide to accessing CarmenZoom and our office hours is posted on the course Carmen page under Files.
- Students may use the audio and video functions if a webcam and microphone are available. If not, there is still a chat function within CarmenZoom for the student to live chat with the professor or TA in the virtual office hours room.
- [Carmen Zoom](#) help guide

#### **TurnItIn**

- Students at The Ohio State University are accountable for the integrity of the work they submit. Therefore, you should be familiar with the guidelines provided by the [Committee on Academic Misconduct \(COAM\)](#) and [Section A of OSU’s Code of Student Conduct](#) in order to meet the academic expectations concerning appropriate documentation of sources. In addition, OSU has made TurnItIn, a learning tool and plagiarism prevention system, available to instructors. For this class, you will submit your papers to TurnItIn from Carmen. When grading your work, I will interpret the originality report, following [Section A of OSU’s Code of Student Conduct](#) as appropriate. For more information about TurnItIn, please see [the vendor’s guide for students](#). Note that submitted final papers become part of the OSU database.
- Please know that I view TurnItIn first and foremost as a teaching tool to make you a better writer. You will see in your individual originality reports exactly what the instructors see. We WANT you to look at this report as soon as you submit your assignments. If you see an issue, please correct it right away, before we start grading the assignment. You can resubmit without penalty as many times as you want prior to the established due date for any assignment. After the due date, the late policy is in effect.

#### **TopHat**

- TopHat is a web-based response system that allows students to use their own devices provide responses in the classroom. This course uses Top Hat to promote active engagement, allow for synchronous feedback, and monitor attendance.
- [TopHat](#) help guide

#### **Discussion and Communication Guidelines:**

The following are expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Tone and civility:** Let’s maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn’t always come across online and is not always appreciated in-person. The instructional team work very hard to provide a positive learning experience. Please keep this in mind and remain civilized and respectful in your class communications.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say.

#### **Issue Resolution:**

The CLSE believes that student concerns are usually most effectively addressed by the staff closest to the situation. Therefore, students are ordinarily expected to address issues or concerns first with their instructors. If the issue cannot be resolved by your instructor, or for some reason you feel that you

absolutely cannot address your concern with your instructor, please feel free to contact the Course Coordinator or Assistant Director Adam Andrews ([andrews.171@osu.edu](mailto:andrews.171@osu.edu)).

### **Building Emergency Action Plan:**

Each building on campus has a Building Emergency Action Plan (BEAP) outlining that specific building's specific procedures to be followed in the event of a range of emergency situations, including fire, weather, terrorism, chemical spills, etc. It is the role of every Buckeye to help keep each other safe and to be aware of these procedures. You can find all of the campus BEAPs at <https://dps.osu.edu/beap>.

### **Lyft Ride Smart:**

Lyft Ride Smart at Ohio State offers eligible students discounted rides, inside the university-designated [service area](#), from 7 p.m. to 7 a.m. Prices may be impacted by distance, traffic, time of day, special events and prime time surcharges. To qualify for program discounts, users must select "shared ride" when booking in the Lyft app. For more information, visit: <https://ttm.osu.edu/ride-smart>.

### **Mental Health:**

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting [ccs.osu.edu](https://ccs.osu.edu) or calling **614-292-5766**. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at **614-292-5766** and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

### **Title IX:**

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator at [titleix@osu.edu](mailto:titleix@osu.edu).

### **Diversity:**

The Ohio State University affirms the importance and value of diversity of people and ideas. We believe in creating equitable research opportunities for all students and to providing programs and curricula that allow our students to understand critical societal challenges from diverse perspectives and aspire to use research to promote sustainable solutions for all. We are committed to maintaining an inclusive community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among all members; and encourages each individual to strive to reach their own potential. The Ohio State University does not discriminate on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, gender, sexual orientation, pregnancy, protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. (To learn more about diversity, equity, and inclusion and for opportunities to get involved, please

visit: <https://odi.osu.edu/> or <https://cbsc.osu.edu>)

### **Academic Misconduct:**

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed, illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>. We will adhere to this policy.

- Unless otherwise specified for a particular assignment, all submitted work should be a student’s own unique effort. Collaborative efforts are not permitted unless expressly sanctioned for a particular assignment.
- Unless otherwise specified for a particular assignment, use of AI-generated materials for course submissions is not permitted.
- Reusing past work: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you’ve explored in previous courses, please discuss the situation with me.
- Using others’ verbatim words without the use of quotation marks and citation is plagiarism. Paraphrased work requires citation to denote the use of others’ ideas. Copying other’s words without quotation while using citations is still considered plagiarism.
- Use of any technology during a quiz or exam (including but not limited to cell phones, smart watches, headphones, electronic dictionaries, etc.) is strictly prohibited.

### **Copyrighted Class Materials:**

© The Instructor’s lectures and all course materials, including power point presentations, tests, outlines, assignments, and similar materials, are protected by copyright. You may take notes and make copies of course materials for your own use. You may not and may not allow others to reproduce or distribute lecture notes and course materials publicly whether or not a fee is charged without the express written consent of the course instructor or course coordinator.

### **Course Schedule: Spring 2026**

*Schedule and assignments subject to change with as much advance notice as possible*

Week	Lecture Topic	Readings	Assignments Due
1	Introduction to the Course Review of Evolutionary Mechanisms	Nesse RM. How is Darwinian medicine useful? West J Med. 2001 May;174(5):358-60. doi: 10.1136/ewjm.174.5.358. PMID: 11342524; PMCID: PMC1071402.	
2	How do we discover the origins of disease? Exploring Zoonotic Diseases; Using Evolution to determine the cause of cancer; Epidemiology and Koch’s postulates	Walker L, Levine H, Jucker M. Koch's postulates and infectious proteins. Acta Neuropathol. 2006 Jul;112(1):1-4. doi: 10.1007/s00401-006-0072-x. Epub 2006 May 16. PMID:	Reading Reflection 1 Due

		16703338; PMCID: PMC8544537.	
3	The evolution of cancer and using evolution to fight back	Enriquez-Navas PM, Wojtkowiak JW, Gatenby RA. Application of Evolutionary Principles to Cancer Therapy. Cancer Res. 2015 Nov 15;75(22):4675-80. doi: 10.1158/0008-5472.CAN-15-1337. Epub 2015 Nov 2. PMID: 26527288; PMCID: PMC4693617.	Reading Reflection 2 Due
4	A study of Coevolution: HPV vs Humans	Kodaman N, Sobota RS, Mera R, Schneider BG, Williams SM. Disrupted human-pathogen co-evolution: a model for disease. Front Genet. 2014 Aug 25;5:290. doi: 10.3389/fgene.2014.00290. PMID: 25202324; PMCID: PMC4142859.	Reading Reflection 3 Due Topic Selection Statement Due
5	The Red Queen – Evolution of the Immune System: How do we stay ahead of pathogenic evolution?	Claus Wedekind; Thomas Seebeck; Florence Bettens; Alexander J. Paepke. MHC-Dependent Mate Preferences in: Biological Sciences, Vol. 260, No. 1359. (Jun. 22, 1995), pp. 245-249.	
6	How we are artificially selecting for pathogens: Antibiotic resistance  <b>Essay Exam 1</b>	n/a – Exam Prep	Reading Reflection 4 Due
7	Human population dynamics and the role of virulence in evolution		Reading Reflection 5 Due Annotated bibliography due
8	Vaccine development: Using technology to combat evolution – Pathogens fighting back.	Rosini R, Nicchi S, Pizza M, Rappuoli R. Vaccines Against Antimicrobial Resistance. Front Immunol. 2020 Jun 3;11:1048. doi: 10.3389/fimmu.2020.01048. Erratum in: Front Immunol. 2020 Jul 21;11:1578. doi: 10.3389/fimmu.2020.01578. PMID: 32582169; PMCID: PMC7283535.	Reading Reflection 6 Due

9	Vaccine development: Using technology to combat evolution – Technology	Wang C, Yuan F. A comprehensive comparison of DNA and RNA vaccines. Adv Drug Deliv Rev. 2024 Jul;210:115340. doi: 10.1016/j.addr.2024.115340. Epub 2024 May 27. PMID: 38810703; PMCID: PMC11181159.	Reading Reflection 7 Due  Synthetic Review Rough Draft Due
10	Biotechnology and the future of human evolution  <b>Essay Exam 2</b>	n/a – Exam Prep	
11	Using evolution to develop new medicines through phylogenetics	Lässig M, Mustonen V, Nourmohammad A. Steering and controlling evolution - from bioengineering to fighting pathogens. Nat Rev Genet. 2023 Dec;24(12):851-867. doi: 10.1038/s41576-023-00623-8. Epub 2023 Jul 3. PMID: 37400577; PMCID: PMC11137064.	Reading Reflection 8 Due
12	CRISPR – evolving pathogens and ourselves	Prasad K, George A, Ravi NS, Mohankumar KM. CRISPR/Cas based gene editing: marking a new era in medical science. Mol Biol Rep. 2021 May;48(5):4879-4895. doi: 10.1007/s11033-021-06479-7. Epub 2021 Jun 18. PMID: 34143395; PMCID: PMC8212587.	Reading Reflection 9 Due
13	Using CRISPR in xenotransplantation and other tools to fight evolution	Ramachandran G, Bikard D. Editing the microbiome the CRISPR way. Philos Trans R Soc Lond B Biol Sci. 2019 May 13;374(1772):20180103. doi: 10.1098/rstb.2018.0103. PMID: 30905295; PMCID: PMC6452265.	Reading Reflection 10 Due Synthetic Review Final Draft Due
14	The future of evolutionary medicine	Natterson-Horowitz B, Aktipis A, Fox M, Gluckman PD, Low FM, Mace R, Read A, Turner PE, Blumstein DT. The future of evolutionary medicine: sparking innovation in biomedicine and public health. Front Sci.	Reading Reflection 11 Due  SALG Due

		2023;1:997136. doi: 10.3389/fsci.2023.997136. 2023 Feb 28. PMID: 37869257; PMCID: PMC10590274.	
Finals	Essay Exam 3		





# GE Theme course submission worksheet: Origins & Evolution

## Overview

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Courses in the GE Themes aim to provide students with opportunities to explore big picture ideas and problems within the specific practice and expertise of a discipline or department. Although many Theme courses serve within disciplinary majors or minors, by requesting inclusion in the General Education, programs are committing to the incorporation of the goals of the focal theme and the success and participation of students from outside of their program.

Each category of the GE has specific learning goals and Expected Learning Outcomes (ELOs) that connect to the big picture goals of the program. ELOs describe the knowledge or skills students should have by the end of the course. Courses in the GE Themes must meet the ELOs common for **all** GE Themes and those specific to the Theme, in addition to any ELOs the instructor has developed specific to that course. All courses in the GE must indicate that they are part of the GE and include the Goals and ELOs of their GE category on their syllabus.

The prompts in this form elicit information about how this course meets the expectations of the GE Themes. The form will be reviewed by a group of content experts (the Theme Advisory) and by a group of curriculum experts (the Theme Panel), with the latter having responsibility for the ELOs and Goals common to all themes (those things that make a course appropriate for the GE Themes) and the former having responsibility for the ELOs and Goals specific to the topic of **this** Theme.

Briefly describe how this course connects to or exemplifies the concept of this Theme (Origins & Evolution)

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In a sentence or two, explain how this class “fits” within the focal Theme. This will help reviewers understand the intended frame of reference for the course-specific activities described below.

*(enter text here)*

## Connect this course to the Goals and ELOs shared by *all* Themes

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Below are the Goals and ELOs common to all Themes. In the accompanying table, for each ELO, describe the activities (discussions, readings, lectures, assignments) that provide opportunities for students to achieve those outcomes. The answer should be concise and use language accessible to colleagues outside of the submitting department or discipline. The specifics of the activities matter—listing “readings” without a reference to the topic of those readings will not allow the reviewers to understand how the ELO will be met. However, the panel evaluating the fit of the course to the Theme will review this form in conjunction with the syllabus, so if readings, lecture/discussion topics, or other specifics are provided on the syllabus, it is not necessary to reiterate them within this form. The ELOs are expected to vary in their “coverage” in terms of number of activities or emphasis within the course. Examples from successful courses are shared on the next page.

**Goal 1:** Successful students will analyze an important topic or idea at a more advanced and in-depth level than the foundations. In this context, “advanced” refers to courses that are e.g., synthetic, rely on research or cutting-edge findings, or deeply engage with the subject matter, among other possibilities.

**Goal 2:** Successful students will integrate approaches to the theme by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in future.

	Course activities and assignments to meet these ELOs
<b>ELO 1.1</b> Engage in critical and logical thinking.	
<b>ELO 1.2</b> Engage in an advanced, in-depth, scholarly exploration of the topic or ideas within this theme	
<b>ELO 2.1</b> Identify, describe, and synthesize approaches or experiences.	
<b>ELO 2.2</b> Demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts.	

*Example responses for proposals within “Citizenship” (from Sociology 3200, Comm 2850, French 2803):*

<b>ELO 1.1</b> Engage in critical and logical thinking.	<i>This course will build skills needed to engage in critical and logical thinking about immigration and immigration related policy through: Weekly reading response papers which require the students to synthesize and critically evaluate cutting-edge scholarship on immigration; Engagement in class-based discussion and debates on immigration-related topics using evidence-based logical reasoning to evaluate policy positions; Completion of an assignment which build skills in analyzing empirical data on immigration (Assignment #1)</i>
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	<p>Completion 3 assignments which build skills in connecting individual experiences with broader population-based patterns (Assignments #1, #2, #3)</p> <p>Completion of 3 quizzes in which students demonstrate comprehension of the course readings and materials.</p>
<p><b>ELO 2.1</b> Identify, describe, and synthesize approaches or experiences.</p>	<p>Students engage in advanced exploration of each module topic through a combination of lectures, readings, and discussions.</p> <p><u>Lecture</u> Course materials come from a variety of sources to help students engage in the relationship between media and citizenship at an advanced level. Each of the 12 modules has 3-4 lectures that contain information from both peer-reviewed and popular sources. Additionally, each module has at least one guest lecture from an expert in that topic to increase students' access to people with expertise in a variety of areas.</p> <p><u>Reading</u> The textbook for this course provides background information on each topic and corresponds to the lectures. Students also take some control over their own learning by choosing at least one peer-reviewed article and at least one newspaper article from outside the class materials to read and include in their weekly discussion posts.</p> <p><u>Discussions</u> Students do weekly discussions and are given flexibility in their topic choices in order to allow them to take some control over their education. They are also asked to provide information from sources they've found outside the lecture materials. In this way, they are able to explore areas of particular interest to them and practice the skills they will need to gather information about current events, analyze this information, and communicate it with others.</p> <p>Activity Example: Civility impacts citizenship behaviors in many ways. Students are asked to choose a TED talk from a provided list (or choose another speech of their interest) and summarize and evaluate what it says about the relationship between civility and citizenship. Examples of Ted Talks on the list include Steven Petrow on the difference between being polite and being civil, Chimamanda Ngozi Adichie's talk on how a single story can perpetuate stereotypes, and Claire Wardle's talk on how diversity can enhance citizenship.</p>
<p><b>ELO 2.2</b> Demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts.</p>	<p>Students will conduct research on a specific event or site in Paris not already discussed in depth in class. Students will submit a 300-word abstract of their topic and a bibliography of at least five reputable academic and mainstream sources. At the end of the semester they will submit a 5-page research paper and present their findings in a 10-minute oral and visual presentation in a small-group setting in Zoom.</p> <p>Some examples of events and sites: The Paris Commune, an 1871 socialist uprising violently squelched by conservative forces</p>

	<i>Jazz-Age Montmartre, where a small community of African-Americans—including actress and singer Josephine Baker, who was just inducted into the French Pantheon—settled and worked after World War I.</i> <i>The Vélodrome d’hiver Roundup, 16-17 July 1942, when 13,000 Jews were rounded up by Paris police before being sent to concentration camps</i> <i>The Marais, a vibrant Paris neighborhood inhabited over the centuries by aristocrats, then Jews, then the LGBTQ+ community, among other groups.</i>
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## Goals and ELOs unique to Origins & Evolution

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Below are the Goals and ELOs specific to this Theme. As above, in the accompanying Table, for each ELO, describe the activities (discussions, readings, lectures, assignments) that provide opportunities for students to achieve those outcomes. The answer should be concise and use language accessible to colleagues outside of the submitting department or discipline. The ELOs are expected to vary in their “coverage” in terms of number of activities or emphasis within the course. Examples from successful courses are shared on the next page.

**GOAL 3:** Successful students will appreciate the time depth of the origins and evolution of natural systems, life, humanity, or human culture, and the factors that have shaped them over time.

**GOAL 4:** Successful students will understand the origins and evolution of natural systems, life, humanity, or human culture, and the factors that have shaped them over time.

	Course activities and assignments to meet these ELOs
<b>ELO 3.1</b> Illustrate their knowledge of the time depth of the universe, physical systems, life on earth, humanity or human culture by providing examples or models.	
<b>ELO 3.2</b> Explain scientific methods used to reconstruct the history of the universe, physical systems, life on earth, humanity or human culture and specify their domains of validity.	
<b>ELO 3.3</b> Engage with current controversies and problems related to origins and evolution questions.	
<b>ELO 4.1</b> Describe their knowledge of how the universe, physical systems, life on Earth, humanity or human culture have evolved over time.	
<b>ELO 4.2</b> Summarize current theories of the origins and evolution of the universe, physical systems, life on earth, humanity or human culture.	

# Biology 3730 Proposal

## Concurrence Requests

### Department of Anthropology

- Concurrence denied on 2/3.
- The CLSE worked with the faculty instructors of the overlapping course to align the content more appropriately. Faculty gave approval on 3/7.
- Formal concurrence of the revisions was requested from the Chair on 3/7/2025. No response was received.

### Department of Evolution, Ecology, and Organismal Biology

- Concurrence requested 2/28. No response was received.

### Department of History

- Concurrence received 4/22.

### Department of Microbiology

- Concurrence received 4/23.

### College of Pharmacy

- Concurrence was received 4/29.

**Tuesday, April 29, 2025 at 07:35:51 Eastern Daylight Time**

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**Subject:** Re: Biology 3730 Concurrence Request  
**Date:** Monday, April 28, 2025 at 6:16:10 PM Eastern Daylight Time  
**From:** Levi, Scott  
**To:** Andrews, Adam  
**Attachments:** image001.png

Adam,

We've reviewed and I'm happy to offer History's concurrence.

Best,  
Scott



**Scott Levi**  
Professor and Chair  
**Department of History**  
100A Dulles Hall  
230 Annie and John Glenn Avenue  
Columbus, OH 43210-1367  
614-292-3001 Office / 614-292-2447 Office / 614-292-2282 Fax

[levi.18@osu.edu](mailto:levi.18@osu.edu) [history.osu.edu](http://history.osu.edu)

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**From:** Andrews, Adam <[andrews.171@osu.edu](mailto:andrews.171@osu.edu)>  
**Date:** Monday, April 28, 2025 at 2:53 PM  
**To:** Levi, Scott <[levi.18@osu.edu](mailto:levi.18@osu.edu)>  
**Subject:** Re: Biology 3730 Concurrence Request

Scott,

My sincere apologies, but I actually did intend to send the request to you *and* Pharmacy owing to your cross-listed Vaccines course. Sorry for the confusion.

Regards,  
Adam



**Adam L. Andrews**  
Assistant Director for Curriculum & Instruction  
**College of Arts and Sciences** | Center for Life Sciences Education

**Subject:** RE: Bio 3730 Revisions  
**Date:** Wednesday, April 23, 2025 at 4:37:43 PM Eastern Daylight Time  
**From:** Ruiz, Natividad  
**To:** Andrews, Adam  
**Attachments:** image001.png

Hi Adam,

Sorry for the delay getting back to you. I was traveling.

We appreciate the changes that you made. It should be OK on our end. Hopefully you will get feedback from EEOB.

Natacha

**Natividad Ruiz, PhD**

Professor  
Vice Chair for Teaching and Undergraduate Affairs  
Department of Microbiology  
The Ohio State University

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**From:** Andrews, Adam <[andrews.171@osu.edu](mailto:andrews.171@osu.edu)>  
**Sent:** Monday, April 21, 2025 9:44 AM  
**To:** Ruiz, Natividad <[ruiz.82@osu.edu](mailto:ruiz.82@osu.edu)>  
**Subject:** Re: Bio 3730 Revisions

Natacha,

I made some changes to the topics in our proposed evolutionary medicine course, removing elements of pandemics and adding several weeks of discussion of the evolution of cancer specifically. I recognize there is still some overlap with 2270, but would like your thoughts on whether this is acceptable.

Thank you,  
Adam



**Adam L. Andrews**

Assistant Director for Curriculum & Instruction  
College of Arts and Sciences | Center for Life Sciences Education

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(614) 247-6345 Office / (614) 292-4390 Fax  
[andrews.171@osu.edu](mailto:andrews.171@osu.edu) [clse.osu.edu](http://clse.osu.edu)



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**From:** Andrews, Adam <[andrews.171@osu.edu](mailto:andrews.171@osu.edu)>

**Date:** Tuesday, March 11, 2025 at 1:52 PM

**To:** Ruiz, Natividad <[ruiz.82@osu.edu](mailto:ruiz.82@osu.edu)>

**Subject:** Re: Bio 3730 Revisions

Natacha,

No need to apologize; I truly appreciate your and the other faculty's thoughtful review and consideration of the course.

I admittedly struggled with revised title, so I appreciate and will happily adopt your suggestion if the course moves forward.

After revising the original course to reduce the overlap with Anthropology, I was genuinely concerned that we might start to overlap too much with Micro's catalog and potentially EEOB's 2270. The jury is still out on EEOB. I can certainly understand if you feel like there is too much overlap with 3704 as written to offer concurrence. I'll think about how the course might be further revised to make it more distinct.

Thank you,  
Adam



THE OHIO STATE UNIVERSITY  
CENTER FOR LIFE SCIENCES EDUCATION

**Adam L. Andrews**

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**From:** Ruiz, Natividad <[ruiz.82@osu.edu](mailto:ruiz.82@osu.edu)>

**Date:** Monday, March 10, 2025 at 4:36 PM

**To:** Andrews, Adam <[andrews.171@osu.edu](mailto:andrews.171@osu.edu)>

**Subject:** RE: Bio 3730 Revisions

Hi Adam,

I apologize again for the delay getting back to you.

I sought input from several faculty in Microbiology who are either in our Curriculum Committee or teach relevant courses. Here are our collective thoughts:

1. We support the development of a course in evolutionary medicine. We imagine that the course will be of interest to many students in pre-health/medicine.

Wednesday, April 30, 2025 at 07:23:02 Eastern Daylight Time

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**Subject:** RE: Biology 3730 Concurrence Request  
**Date:** Tuesday, April 29, 2025 at 8:06:21 PM Eastern Daylight Time  
**From:** Kwiek, Nicole  
**To:** Andrews, Adam  
**CC:** Newman, Leslie  
**Attachments:** image002.png, image003.png

Hi Adam,  
Thank you for passing along this great syllabus proposal! The College of Pharmacy pass along its concurrence.

Good luck with this new offering of PHR3730!

Best,  
Nicole

Cc: Leslie Newman, Director of Undergraduate Studies



**Nicole Cartwright Kwiek, PhD, FAAPE**

Senior Associate Dean for Academic Affairs and Educational Innovation  
Clinical Professor of Pharmacy Education and Innovation  
College of Pharmacy

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[kwiek.1@osu.edu](mailto:kwiek.1@osu.edu) | [pharmacy.osu.edu](http://pharmacy.osu.edu)

Pronouns: she/her/hers

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**From:** Andrews, Adam <[andrews.171@osu.edu](mailto:andrews.171@osu.edu)>  
**Sent:** Monday, April 28, 2025 1:26 PM  
**To:** Kwiek, Nicole <[kwiek.1@osu.edu](mailto:kwiek.1@osu.edu)>  
**Subject:** Biology 3730 Concurrence Request

Dr. Kwiek,

The Center for Life Sciences Education has developed a proposal for a new course, Biology 3730 - *Humans vs. Germs: An Arms Race Between Medicine and Evolution*, and we are requesting the College of Pharmacy's review for concurrence. The syllabus is attached.