

Term Information

Effective Term Spring 2023
Previous Value Autumn 2019

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Align course goals and syllabus with new GE

Update course goals and topic lists

Increase location of offering

What is the rationale for the proposed change(s)?

Need to alter syllabus and provide GE rationale for this existing class.

New instructor has modified some of the course topics and needs updated

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

none

Is approval of the request contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Entomology
Fiscal Unit/Academic Org	Entomology - D1130
College/Academic Group	Food, Agric & Environ Science
Level/Career	Undergraduate
Course Number/Catalog	1350
Course Title	The Biology of Hope and Belief
Transcript Abbreviation	Biol Hope Belief
Course Description	The underlying premise of this course is that the human mind and human behaviors have been shaped throughout our evolutionary history by the force of natural selection. This course critically evaluates evidence that the human capacity for hope and the human desire to believe in a supernatural deity evolved because they helped our ancestors survive.
<i>Previous Value</i>	<i>The underlying premise of this course is that the human mind and human behaviors have been shaped by the force of natural selection. Some of these behaviors are complex, longstanding and present in every human culture ever studied. This course explores the biological basis for two of them: the human capacity for hope and the human desire to believe in a supernatural deity.</i>
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 Week, 4 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	Yes
Is any section of the course offered	100% at a distance
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
Previous Value	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites

Exclusions

[Previous Value](#)

Not open to students with credit for Biology 1350.

Electronically Enforced

Yes

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	26.0101
Subsidy Level	General Studies Course
Intended Rank	Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

General Education course:
Biological Science; Natural Sciences

[Previous Value](#)

[General Education course:](#)
[Biological Science](#)

Course Details

Course goals or learning objectives/outcomes

- Understand the biological basis of hope and belief among humans and other animals.
- Become scientifically literate and learn how science is done and how to interpret and analyze scientific results.
- Gain an abiding appreciation for the importance of hope and belief to humans and our societies.
- [Students understand the basic facts, principles, theories and methods of modern science.](#)
- [Students understand key events in the development of science and recognize that science is an evolving body of knowledge.](#)
- [Students describe the inter-dependence of scientific and technological developments.](#)
- [Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.](#)

[Previous Value](#)

Content Topic List

- Epistemologies: Different ways of knowing
- Forming beliefs and How it is Done
- Receptivity to the Supernatural
- Natural Selection
- How Neurons Work
- Neurobiology of Emotion
- Music and the brain
- Animals, hope and morality
- Evolution of the brain
- Evolution of religion
- Neurochemistry and hope
- Neurotheology
- Spiritual beliefs in the brain
- The God gene

Previous Value

- *Biology of Hope Take One: Several Views from History, Science*
- *The Nervous System and Science of Perception*
- *Structure of Central and Peripheral Nervous Systems*
- *How Neurons Communicate*
- *Biochemistry & Neurochemistry of Chemically-Induced Emotions*
- *Biology of Hope Revisited: Addiction Research and Hope*
- *Neurochemistry of Hope: Placebos and the Benedetti Experiments*
- *Serotonin and Artificial Hope*
- *Yin-Yang Relationship of Hope and Despair: Quantifying Hope*
- *Do Animals Have Hope?—Scientific Experiments*
- *Do Animals Have Hope?—Views from Natural History*
- *The Upright Ape: Evolution of the Human Brain and Bipedalism*
- *How Coming Down from the Trees Changed Human Society*
- *Moral Behavior in the Great Apes/Experiments with Primates and Other Animals*
- *The Moral Ape: Morality in Humans/Trolley Car Experiments*
- *Hope as a Progenitor of religion, Selective Advantage of a Sacred Narrative*
- *Evolution of religion: Four Mental Criteria for Acquiring Religion*
- *Evidence of Religious Practice Among Hunter-Gatherers*
- *Forming Beliefs and How it is Done*
- *From Causality to Supernatural Agency: The Princess Alice Experiments*
- *Don't Stop Believing: Receptivity to the Supernatural*
- *Do You Believe in Magic?*
- *Spiritual Beliefs in the Brain*
- *Is There a God Gene? The Heritability of Belief*
- *The Strange Case of Music: a portal to the Divine?*
- *Neurotheology*

COURSE CHANGE REQUEST
1350 - Status: PENDING

Last Updated: Osborne, Jeanne Marie
06/29/2022

Sought Concurrence

No

Attachments

- 2022.06.28_ENTMLGY 1350 Syllabus_ODEE template_Revised 3.pdf: Revised Syllabus
(Syllabus. Owner: Klinger, Ellen G)
- 2022.06.28ENTMLGY 1350_GE-foundations-submission form_REVISED.3.pdf: GE Nat Science Submission Form
(Other Supporting Documentation. Owner: Klinger, Ellen G)

Comments

- Syllabus revised by instructor per email message 14 June 2022 *(by Klinger, Ellen G on 06/29/2022 10:49 AM)*
- Revise as per COAA via email message 14 June 2022

Revise as per email message 2 June 2022 *(by Osborne, Jeanne Marie on 06/14/2022 02:03 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Klinger, Ellen G	05/09/2022 01:59 PM	Submitted for Approval
Approved	Strange, James P	05/12/2022 01:20 PM	Unit Approval
Revision Requested	Osborne, Jeanne Marie	06/02/2022 02:26 PM	College Approval
Submitted	Strange, James P	06/02/2022 02:27 PM	Submitted for Approval
Approved	Strange, James P	06/02/2022 02:27 PM	Unit Approval
Revision Requested	Osborne, Jeanne Marie	06/02/2022 02:51 PM	College Approval
Submitted	Klinger, Ellen G	06/08/2022 01:33 PM	Submitted for Approval
Approved	Strange, James P	06/09/2022 02:36 PM	Unit Approval
Revision Requested	Osborne, Jeanne Marie	06/14/2022 02:03 PM	College Approval
Submitted	Klinger, Ellen G	06/29/2022 10:49 AM	Submitted for Approval
Approved	Klinger, Ellen G	06/29/2022 10:53 AM	Unit Approval
Approved	Osborne, Jeanne Marie	06/29/2022 04:10 PM	College Approval
Pending Approval	Cody, Emily Kathryn Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	06/29/2022 04:10 PM	ASCCAO Approval

Syllabus

ENTMLGY 1350

The Biology of Hope and Belief

Spring Semester 2023

GE Foundations, Natural Science

All Semesters: Online

Course Information

- **Course times and location:** This is a fully asynchronous online course.
- **Credit hours:** 3 credit hours
- **Mode of delivery:** Distance Learning

Instructor

- **Name:** Dr. Megan Meuti
- **Email:** meuti.1@osu.edu
- **Office location:** 232C Howlett Hall
- **Office hours:** Times are posted on Carmen; we will meet by Zoom
- **Office phone:** 614-688-2829
- **Preferred means of communication:**
 - My preferred method of communication for questions is **email**.
 - My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to be sure you receive these messages.

Course Prerequisites and/or co-requisite:

- **None**



Course Description

Welcome to this fully online, asynchronous course! This course, ENTMLGY 1350: The Biology of Hope and Belief, provides an introduction to and foundation for the study of Natural Science through exploring the human capacity to hope and believe in supernatural entities. The underlying premise of this course is that the human mind and human behaviors have been shaped throughout our evolutionary history by the force of natural selection. This course critically evaluates evidence that the human *capacity for hope* and the human *desire to believe in a supernatural deity* evolved because they helped our ancestors survive.

In our first Unit we will discuss how we know what we know through different epistemological frameworks. Specifically, we will determine how scientific beliefs are similar to and different from other beliefs/ways of knowing and understanding our world, how scientific experiments are done, and why peer review bolsters the credibility of scientific findings. We will also examine how beliefs are formed neurologically as children develop and evidence that morality is genetic and hardwired into our biology long before we can walk or talk.

In our second Unit we will explore how evolution by means of natural selection functions to leave organisms better-suited to their environment and apply basic facts and biological principles (e.g. concentration gradients, cellular membrane transport, and signal transduction) to learn how neurons within our brains function. We will then apply this knowledge to learn how specific neurotransmitters (e.g. oxytocin, dopamine, and serotonin) are involved in romantic love and hope, and to what extent animals can also feel complex emotions and hope due to our shared evolutionary history and highly similar neurobiology.

In the third Unit we will seek to understand how the force of natural selection might have led to both hope and religious faith in our early human ancestors by considering the anatomical and neurological changes that developed in our ancestors as they evolved from non-human primates. We also discuss how evolutionary game theory can be applied to explain the basis of altruistic behaviors, how these are related to hope and belief, and how altruism, hope and belief might have facilitated group cohesion and promoted survival of our human ancestors.

In our fourth and final Unit, we will explore how recent technological advancements, such as new brain imaging technologies and the sequencing of the human genome, have contributed to our understanding of the biological basis of depression, and how this in turn has led to the development of drugs that can artificially increase hope. We also discuss the regions of the brain that are involved in religious states such as reverie, mysticism and hallucination. We will learn how brain activity is studied using various types of brain scans and data from brain-injured subjects. We will evaluate data used to support different points of view about the reality of religious states, as well as genetic evidence of the basis of hope, hopelessness and belief, and how hope and belief are beneficial to modern humans and our societies.

The course, in short, provides a strong foundation in the natural sciences by incorporating several biological disciplines (evolutionary biology, neurobiology, genetics, physiology and behavior) while exploring the biological bases for qualities thought to be uniquely human: our capacity for hope and our relationship to a supernatural deity. Note that we will NOT debate or undermine the validity of any religious beliefs, but rather will critically evaluate the evidence supporting the biological basis for hope and faith.



General Education Goals & Expected Learning Outcomes (ELOs)

This course and ENTMLGY 1351: Experimentally Evaluating The Biology of Hope and Belief fulfill the General Education (GE) rationale for the GE Foundations: Natural Sciences category. Specifically, ENTMLGY 1350 (this course) fulfills Natural Sciences Goals 1 and 2 and Expected Learning Outcomes (ELOs) 1.1, 1.2, 2.1, 2.2 and 2.3. This course also partially fulfills ELO 1.3. When this 3-credit ENTMLGY 1350 lecture is taken in combination with the 1-credit ENTMLGY 1351 laboratory, together these 4 credits (e.g. 3-credit lecture + 1-credit laboratory) fulfill ALL Goals (Goals 1 and 2) and ALL Expected Learning Outcomes (ELOs 1.1, 1.2, 1.3, 2.1, 2.2 and 2.3) for the GE Foundations, Natural Science category. Therefore, these courses are designed to prepare students to be able to do the following:

GOAL 1: engage in theoretical and empirical study within the natural sciences, gaining an appreciation of the modern principles, theories, and modes of inquiry used generally across the natural sciences.

ELO 1.1 explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.

ELO 1.2 identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.

ELO 1.3 employ the processes of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models, and analysis of data.

GOAL 2: discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.

ELO 2.1 analyze the inter-dependence and potential impacts of scientific and technological developments.

ELO 2.2 evaluate social and ethical implications of natural scientific discoveries.

ELO 2.3 critically evaluate and responsibly use information from the natural sciences.

- This course fulfills both the Natural Science GE and course-specific (see below) learning goals and Outcomes by allowing students to apply what we will learn about evolution by means of natural selection, neurobiology, genetics, physiology and behavior in humans and other animals to understand how the biological and neurochemical basis of hope in humans and other animals, as well as how and why hope and belief might have benefitted early humans. This is largely accomplished by allowing students to demonstrate their understanding through weekly quizzes and homework assignments, as well as larger Unit Assessments to synthesize information from multiple topics.



- To clearly see how these course goals and learning objectives are assessed, and how they relate to the GE and course-specific learning outcomes, please see the alignment table on pgs. 12 and 13.

Course-specific Learning Goals

By the end of this course, students should successfully be able to:

- I. understand the biological basis of hope and belief among humans and other animals.
- II. become scientifically literate and learn how science is done and how to interpret and analyze scientific results.
- III. gain an abiding appreciation for the importance of hope and belief to humans and our societies.

Course-specific Learning Outcomes

By the end of this course, students should successfully be able to:

1. articulate how the process of evolution by the means of natural selection could have contributed to the human capacity for hope and belief.
2. compare and contrast human neurobiology and behavior with those of other animals.
3. distinguish between scientific and religious epistemological frameworks, identify when each are useful and how they can coexist.
4. examine neurobiological, behavioral, genetic and social evidence supporting the biological basis for hope and belief.
5. articulate how new scientific ideas and technological advancements have contributed to our understanding of hope and belief.
6. integrate biological information and other forms of data to evaluate the impact of hope and belief on human well-being.
7. evaluate the social and ethical implications of understanding hope/belief in animals and humans.
8. describe how science is done and what makes for credible science.

- This course fulfills both the Natural Science GE and course-specific learning goals and Outcomes by allowing students to apply what we will learn about evolution by means of natural selection, neurobiology, genetics, physiology and behavior in humans and other animals to understand how the biological and neurochemical basis of hope in humans and other animals, as well as how and why hope and belief might have benefitted early humans. This is largely accomplished by allowing students to demonstrate their understanding through weekly quizzes and homework assignments, as well as larger Unit Assessments to synthesize information from multiple topics.

- To clearly see how these course goals and learning objectives are assessed, and how they relate to the above GE goals, please see the alignment table on pgs. 12 and 13.

How this course works

Mode of delivery: This course is 100% online. There are no required sessions when you must be logged in to Carmen at a scheduled time.

Pace of online activities: This course is divided into **weekly modules** that are released one week ahead of time. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame.

Credit hours and work expectations: This is a 3 credit-hour course. According to [Ohio State bylaws on instruction](http://go.osu.edu/credithours) (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (watching instructor-generated videos) in addition to 6 hours of homework (reading assigned articles and completing homework assignments) to receive a grade of a C average. Therefore, for this 3-credit hour course, students should expect to spend approximately 9 hours/week on course-related activities. Students who spend 6-9 hrs/week on this course tend to earn A's and B's.

Attendance and participation requirements: Research shows regular participation is one of the highest predictors of success. With that in mind, I have the following expectations for everyone's participation:

- **Participating in online activities for attendance: at least once per week**
You are expected to log in to the course in Carmen every week. During most weeks you will probably log in many times. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.
- **Zoom meetings and office hours: optional**
All live, scheduled events for the course, including my office hours, are optional. I will post recordings of extra credit, optional synchronous sessions for those who cannot attend during these sessions.
- **Participating in discussion forums: optional**
To earn extra credit (see information below), you may post or answer questions on a group discussion forum and/or respond to questions related to that week's specific activity.
- **Participating in synchronous study sessions: optional**
To earn extra credit (up to 5 pts/session; see information below), you may participate in synchronous study sessions. These will be offered three times throughout the semester, and will allow you to get to know Dr. Meuti and your fellow classmates better, ask and answer questions and discuss course material in real time. These will be hosted

over Zoom. Information for each session will be provided on the Carmen course website.

Course Materials, Fees and Technologies

Required Materials

- Fisher, S.W. and M.L. Fisher (2015). *The Biology of Hope and Belief*. ISBN: 978-0-9961672-6-0
 eBook - <https://www.sentiapublishing.com/health-sciences/the-biology-of-hope-and-belief-susan-fisher-online-textbook/>
 - **Focus of Resource:** Most of the assigned reading will come from the textbook written for this course by a former instructor, Dr. Susan Fisher. The assigned readings support both the Natural Science Foundations GE Expected Learning Outcomes as well as course learning outcomes. For example, “*Chapter 22: Don’t Stop Believin’*” supports GE ELO 2.2 by discussing the relationship between our natural and scientific beliefs (e.g. “if I drop the ball it will fall down”) to social and ethical beliefs (e.g. “if I do something that is wrong/bad, I will be ostracized and possibly punished by supernatural forces”), as these are both causal beliefs that form naturally in our brains.
 Similarly, *Chapter 22: Do You Believe in Magic?* supports GE ELO 1.1 and continues to build on this theme by showing how superstitious beliefs are an overextension of pattern recognition and would have been beneficial to our human ancestors as we evolved. This is because it would often be better to believe in something that wasn’t there (e.g. think that a dangerous predator caused the grass to move when really it was just the wind) than it would be to believe something wasn’t there when it was (e.g. think that the wind caused the grass to move when it was, in fact, a dangerous predator). Therefore, believing in things that weren’t there left our ancestors with interesting and fictitious stories/myths, whereas NOT believing in things that were there could have likely led to our demise as a species.
 - **Why the book is required:** While many topics from the readings are also discussed in the recorded online lectures, to gain a more complete understanding of the topic, and to better support the GE Goals and Learning Outcomes the text is needed. This deeper understand will be needed to earn full credit on the quizzes, homework assignments and unit assessments.
 - **Why you might decide to NOT purchase the book, and the consequences of not completing the readings:** Some students have decided NOT to purchase the textbook and rely on information solely presented in the lectures. With extra effort, these students have earned C’s or B’s in the course. Therefore, you can make a decision as to whether or not you will purchase the textbook.



- Please note: if you order the E-book version, you will need to use the password that the publisher provides on the completed order screen to download the book. **Please read each screen in its entirety.** If you do not see the password, use the publisher's "Search" field and type in "password."
- All other reading assignments will be posted to the Carmen course website.

Please complete all reading assignments before watching the recorded lectures. Quiz questions will be created using information presented in the readings and videos, so to earn the highest grade possible, you should ensure that you understand all the material in the readings and recorded lectures. 😊 If you do NOT purchase the textbook or complete the readings, it is likely that your grade will slightly decline.

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection
- **Webcam:** built-in or external webcam, fully installed and tested
- **Microphone:** built-in laptop or tablet mic or external microphone
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for technology and internet access at go.osu.edu/student-tech-access.

Required Software

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit the [installing Office 365](https://go.osu.edu/office365help) (go.osu.edu/office365help) help article for full instructions.

CarmenCanvas Access

You will need to use [BuckeyePass](https://buckeyepass.osu.edu) (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](https://go.osu.edu/add-device) (go.osu.edu/add-device) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.

- [Install the Duo Mobile application](https://go.osu.edu/install-duo) (go.osu.edu/install-duo) on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at [614-688-4357 \(HELP\)](tel:614-688-4357) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- [Navigating CarmenCanvas](https://go.osu.edu/canvasstudent) (go.osu.edu/canvasstudent)
- [CarmenZoom virtual meetings](https://go.osu.edu/zoom-meetings) (go.osu.edu/zoom-meetings)
- [Recording a slide presentation with audio narration and recording, editing and uploading video](https://go.osu.edu/video-assignment-guide) (go.osu.edu/video-assignment-guide)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat:** go.osu.edu/it
- **Phone:** [614-688-4357 \(HELP\)](tel:614-688-4357)
- **Email:** servicedesk@osu.edu

Grading and Faculty Response

How Your Grade is Calculated

Assignment Category	Points	Percentage of final grade
Syllabus Assessment	10	2%
Weekly quizzes (1 per week per 10 weeks; lowest score is dropped)	10 pts each x 9 = 90 pts	18%
Homework Assignments (1 per week for 11 weeks; lowest score is dropped)	20 pts each x 10 = 200 pts	40%
Course Unit Assessments (4 each worth 50 pts; can NOT be dropped)	50 pts x 4 = 200 pts	40%

See Course Schedule for due dates.

Descriptions of Major Course Assignments

Syllabus Assessment

Description: This assessment is used to ensure that you have read and understand the policies, expectations and course format described in the syllabus. You must complete this by **Friday January 13th at 11:59 pm Eastern Time** so that you can unlock and access other course content.

Academic integrity and collaboration: This quiz is open-book and untimed. Students must complete the syllabus quiz on their own, but they will have multiple untimed opportunities to take the quiz.

Weekly Quizzes

Description: These quizzes are used to ensure that you understand core concepts that were discussed in the reading and recorded lectures. They are timed (15 minutes) and must be completed before 11:59 pm Eastern Time on the Friday of the week when they are assigned.

Academic integrity and collaboration: These quizzes are closed book, closed notes/internet and timed. Students must complete the quizzes on their own and should NOT discuss questions or answers with their classmates. Correct answers will be released the Saturday and Sunday after the quiz completion deadline.

Weekly Assignments

Description: You will be asked to complete an assignment each week for 11 weeks. These will allow you to apply information learned in the lectures. They may include watching a video, reading articles, answering questions, reflecting on your own personal experiences or creating something original (Venn diagram, write a poem, etc.). Unless otherwise stated, all responses must be typed and submitted as a PDF file to the correct assignment folder on the Carmen course website. Each assignment is worth 20 points and will be **due by 11:59 pm Eastern Time on the Monday following the week it is posted.** You will be able to drop your lowest score. This means that if you choose NOT to complete one assignment, this score will automatically be dropped from your grade. Or if you complete all assignments (recommended to best support your learning) then your lowest score will be dropped.

Academic integrity and collaboration: Each student must turn in an assignment that is their own work. Students may work with other students on specific areas that will be clearly designated by the instructor within the Carmen assignment.

Unit Assessments

Description: After each of the 4 units in the course there will be a comprehensive assessment that will allow you to synthesize information from that unit. Each will be worth 50 points and will be due on the Monday following the unit at 11:59 pm Eastern Time. *These are NOT optional/cannot be dropped.* Please pay attention to the assignment descriptions and rubrics posted with each assignment in Carmen as these will be the basis for your grade. Limited details on each unit assessment are below. Additional information for each assessment and rubrics will be provided in the Carmen site for this course.

- **Unit I Assessment:** Infographic displaying “how we know what we know”. For this assignment you will create a 1-4 page infographic comparing and contrasting scientific vs. religious knowledge and describing how beliefs are formed.
- **Unit II Assessment:** Socratic interview to teach a peer/family member (not in this class) about natural selection, intelligence and hope in animals. This interview can be conducted via Zoom or any other platform to create an MP4 file.
- **Unit III Assessment:** Newsletter describing how altruism evolved. For this assessment you will craft a newsletter that explains how altruistic behaviors might have evolved and their benefits to social groups.
- **Unit IV Assessment:** Essay describing how hope and belief are beneficial to modern humans and societies. For this assessment, you will complete an individual essay where you synthesize information presented throughout the course and conduct investigative journalism to find credible sources that illustrate that hope and belief are beneficial to modern humans and our societies. As part of the essay, you will critique the validity/rigor of your sources/evidence.

Academic integrity and collaboration: Each student must submit a Unit Assessment that represents their own work. You are to write all information **in your own words (e.g. do NOT directly quote a source)**, and you are expected to cite all of your sources using a standard

citation style (e.g. MLA, AMA, Chicago Author-Date, etc.). [For details on citation styles and examples please see this link.](#) Each Unit Assessment will be submitted to the appropriate assignment on Carmen and checked with “TurnItIn” to ensure that your submission does not match other students’ work and published information on the internet. You will be able to see your similarity score and can revise and resubmit your final reflection if TurnItIn identifies specific areas that are potentially problematic.

Extra Credit Opportunities (up to 50 pts = 10% of your final grade)

- **Course pre, and post course evolution surveys:** To assess how this course impacts your understanding and attitudes towards evolution, you will have the opportunity to complete pre- and post-course surveys. These surveys are completely optional and are **worth 5 points each (10 points total), but you must complete BOTH the pre and post course survey to receive credit.**
- **Midterm feedback survey:** This anonymous survey will allow you to provide valuable feedback on what is helping or hindering your learning in this course so that I can improve it this the semester and in future offerings. This survey will be available during the 7th week of classes (*Due Friday February 24th*) and will be worth 5 points. Points will be assessed through an anonymous Carmen quiz that will give you the points automatically without the instructor knowing who has given which answer.
- **Participation in weekly discussions:** For 10 weeks with normally scheduled modules, an optional extra credit discussion board will be available. You can ask a question, answer a peer’s question or reflect on how the course material relates to your life. You can earn up to 1 extra credit point for each week that you participate (max of 10 pts).
- **Participation in synchronous study sessions:** Throughout the semester I will host 3 synchronous Zoom meetings. Students who attend will have the opportunity to ask and answer questions in real-time, discuss relevant material/articles, provide feedback on the course and further engage with the material. Participation in these sessions will be worth up to 5 pts/session (maximum of 15 extra credit points).
- **Random Acts of Hope:** You have the option of earning up to 10 points for practicing Random Acts of Hope. These can be almost anything. For instance, you might call a friend or family member who you know is having a difficult time. You might purchase or prepare a meal for someone less fortunate, or help a stranger find her lost dog. You can report anything you do that helps some other creature that requires selfless effort on your part. **To get credit, you need to do two things: write down what you did and explain how it made you feel.** You must upload your Random Act of Hope as a single document on Carmen before **11:59 pm Eastern Time on Friday April 14th**. For each act, you will receive 1 point, up to a total of 10 points (i.e., up to 10 acts).



Alignment Table

GE Goal	GE ELO	Course ELOs	Course Assessments	How assessments support GE ELO
<p>GOAL I: Successful students will engage in theoretical and empirical study within the natural sciences, gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.</p>	<p>1.1: Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.</p>	<p>1. Articulate how the process of evolution by the means of natural selection could have contributed to the human capacity for hope and belief.</p> <p>2. Compare and contrast human neurobiology and behavior with those of other animals.</p> <p>3. Distinguish between scientific and religious epistemological frameworks, identify when each are useful & how they can coexist.</p>	<p>Assignment 1: What makes a source credible?</p> <p>Assignment 2: Differences between Scientific and Religious ways of Knowing</p> <p>Assignment 3: Predict how animals will respond to climate change</p> <p>Assignment 4: Compare and contrast human neurobiology and behavior with those of other animals.</p>	<p>These assessments will allow students to explain <i>fundamental facts and principles</i> (e.g. concentration gradients, membrane potential and membrane transporters allow neurons to communicate) and <i>theories</i> (e.g. apply Darwin's Theory of Natural Selection to predict how animals will respond to climate change) as well as the <i>methods</i> that natural scientists use to acquire new knowledge, and how this is similar to and different from other ways of inquiry (e.g. social sciences, religious belief systems).</p>
	<p>1.2: Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.</p>	<p>4. Examine neurobiological, behavioral, genetic and social evidence supporting the biological basis for hope and belief.</p> <p>5. Articulate how new scientific ideas and technological advancements have contributed to our understanding of hope & belief.</p>	<p>Assignment 5: How does music elicit feelings of hope in humans and affect animals?</p> <p>Assignment 6: How do scientists evaluate animal intelligence and emotions?</p> <p>Unit II Assessment: Socratic Teaching Interview</p>	<p>These assessments will allow students to <i>identify how key events in the development of science</i> (e.g. Theory of Evolution, increased understanding of the human/animal brain, changing views on anthropomorphism) contribute to <i>ongoing and changing nature of scientific knowledge</i> (e.g. current understanding of animals' ability to understand music and experience emotions) and <i>methods</i> (e.g. recently designed experiments to test animal intelligence).</p>
	<p>1.3: Successful students will employ the processes of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models and analysis of data.</p>	<p>1. Articulate how the process of evolution by the means of natural selection could have contributed to the human capacity for hope and belief.</p> <p>8. Describe how science is done and what makes for credible science</p>	<p>Mainly fulfilled in ENTMLGY 1351: Experimentally Evaluating the Biology of Hope& Belief</p> <p>Assignment 3: Predict how animals will respond to climate change</p> <p>Assignment 6, Part IV: Design an experiment to test hope in animals</p> <p>Unit IV Assessment: Critically evaluate of how hope and belief are beneficial to modern humans and societies</p>	<p>These assessments will allow students to employ the <i>process of science</i> by <i>developing hypotheses</i> (e.g. predicting how animals respond to climate change), <i>designing experiments</i> (e.g. measuring hope/expectation in animals), and <i>exploring scientific literature and other credible sources</i> to find evidence that supports each of Darwin's facts and inferences that the human capacity for hope and belief were positively selected for during the course of our evolution.</p>



GE Goal	GE ELO	Course ELOs	Course Assessments	How assessments support GE ELO
GOAL II: Successful students will discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.	2.1 Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments.	5. Articulate how new scientific ideas and technological advancements have contributed to our understanding of hope and belief. 6. Integrate biological information and other forms of data to evaluate the impact of hope and belief on human well-being.	Assignment 9: Can we use the placebo effect to better understand, treat and overcome addiction? Assignment 10: How can game theory help us understand the evolution of belief? Unit IV Assessment: Essay 2b: How has technology improved our understanding of the biology of hope and belief and its positive impact on human well-being?	These assignments will allow students to analyze the <i>inter-dependence of science and technology</i> (e.g. understanding brain function is leading to new therapies for depression; understanding how evolution and game theory is improving machine learning; novel brain imaging techniques in the study of hope) and the <i>potential impacts of scientific and technological advancements</i> (e.g. ability to overcome addiction, being able to model the benefits of belief in social groups; evaluate biological benefits of prayer/meditation).
	2.2. Successful students are able to evaluate social and ethical implications of natural scientific discoveries.	5. Articulate how new scientific ideas and technological advancements have contributed to our understanding of hope and belief. 7. Evaluate the social and ethical implications of understanding hope/belief in animals and humans.	Assignment 7: Becoming Human Assignment 8: Evolution of Religion Unit III Assessment: Newsletter on the evolution of altruism.	These assignments will allow students to examine <i>natural scientific discoveries</i> (e.g. evidence of human evolution, including changes in brain size and structure; selfish genes & the biological benefits of selfishness) and evaluate their <i>social and ethical implications</i> (e.g. how selflessness contributed to changes in early human societies and facilitated the development of belief systems; whether humans can truly be altruistic).
	2.3 Successful students are able to critically evaluate and responsibly use information from the natural sciences.	3. Distinguish between scientific and religious epistemological frameworks, identify when each are useful and how they can coexist 4. Examine neurobiological, behavioral, genetic and social evidence supporting the biological basis for hope and belief. 6. Integrate biological information and other forms of data to evaluate the impact of hope and belief on human well-being	Assignment 1: Credible sources Assignment 8: Evolution of Religion Assignment 11: Defining Hope Unit IV Assessment, Essay 2: Critically evaluate the genetic, neurobiological, and psychological/emotional evidence that support the positive impact that hope and belief on human well-being	These assessments will allow students to <i>critically evaluate information from the natural sciences</i> (e.g. critique scientific studies by consider elements of experimental design, including sample size, research methodology, and the process of peer review) and <i>use this information responsibly</i> (e.g. explain the assumptions/weaknesses with arguments on how religion evolved/developed; use peer-reviewed scientific literature and biological principles to define hope and describe the benefits of hope & belief).

Late Assignments

- Please refer to Carmen for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments. Meeting deadlines is an important aspect of *professionalism in ALL future careers*. Please plan carefully. Deadlines for submitting assigned work are firm, and extensions will NOT be granted for conflicts with the work or other courses, or technological difficulties with Carmen.
 - *Accommodations for students with SLDS plans:* All students that have flexible plans with the Office of Student Life and Disability Services should have their SLDS advisor send their accommodation letter to Dr. Meuti. Additionally, they should meet with me (Dr. Meuti) during the first 2 weeks of class so that we can ensure how to best accommodate deadline modifications and extensions. Typically, a 24-hour extension is granted whenever the student has a flare up of their condition, and as always, advanced notice is appreciated.
 - *Accommodations due to illness or other personal situations are granted only with appropriate documentation (doctor's note, obituary, etc.).* If you need an extension for a family emergency or medical reason, please email me before 5:00 pm on the day the assignment/Unit Assessment is due or within 24-hours of the emergency/illness. Whenever possible, please also provide the documentation. Typically, a 24-hour extension is provided without documentation. If a longer extension is needed, I will need to see documentation
 - *Advanced accommodations:* If you need to have an adjusted schedule (e.g., military duty prevents you from opening or submitting assignments during posted window, etc.), please email Dr. Meuti at least 2 weeks prior to requested schedule changes.
 - *Late work:* To ensure that we all stay on track and that your work does not pile up, assignments/Unit Assessments that are submitted late will receive a 10% penalty for every day they are late, up to 3 days late. After that time, your assignment will not be graded for credit.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **24 hours on days when class is in session at the university**, or **36 hours on the weekend/university holiday**. *If you have not heard back within this timeframe, you can and should send an*



additional email. Please do NOT send multiple emails within a 24 hr period or use Canvas to contact me.

- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Discussion board:** I will check and reply to messages in the discussion boards once mid-week and once at the end of the week.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days**. Assignments submitted after the due date may have reduced feedback, and grades may take longer to be posted.
- **Grading philosophy:** Your weekly homework assignments will be graded by a team of students who previously took the course. Please note that the graders and I do NOT give you points, nor do we take away points away from you. *You either earn or do not earn points on assignments.* The graders and I want you to earn the highest grade possible on every assignment and assessment! I am here to help you by clarifying any instructions and answering questions that you have. 😊 However, ultimately your grade is up to you.
- **Grade Disputes:** Graded material will be made available to you on Carmen. I encourage you to carefully look over the feedback on your assignments. Please be sure to see me during office hours (preferred) or email me if you do not understand why any of your answers were incorrect/did not earn full credit. If you feel that a mistake was made on an assignment/quiz, you have the right to dispute the grade. You must discuss your dispute with me no later than **two weeks after the graded assignment has been made available to you**. After that time, the grade will be final.

Grading Scale

93–100: A
 90–92.9: A-
 87–89.9: B+
 83–86.9: B
 80–82.9: B-
 77–79.9: C+
 73–76.9: C
 70–72.9: C-
 67–69.9: D+
 60–66.9: D
 Below 60: E

Other Course Policies

General Policies and Expectations

- **Class participation:** I expect you to complete the assigned readings and watch the recorded lectures each week so that you can thoughtfully complete course assignments. I expect you to be respectful of your peers, graders and me.
- **Notetaking:** As I want you to earn the highest grade possible, and because full participation in class activities is crucial for success, I expect you to treat this class with the same respect, attention and planning as you treat your other, in-person classes. Therefore, you *should take notes both when reading the course textbook/articles and when watching the lectures*. You should complete your readings and watch the recorded lectures in a quiet place, free from other distractions. Research shows that students learn best and retain the most information when they take notes by hand ([Bonner and Holliday, 2006 J. Research in Science Teaching](#)). ☺
- **Staying informed:** We will closely follow the schedule on the syllabus and will provide updates and reminders to ensure that you are staying on track. If I have to make modifications or adjustments to the course, provide further details or clarification, and/or schedule review sessions, I will post a **course announcement**. Students are responsible for all information communicated via email and course announcements. Therefore, I expect you to *check the course website and your OSU email at least once week*.
- **Managing class data:** Consider composing your academic posts in a word processor and/or saving your work to a cloud-based system. This will allow you to then copy responses into Carmen discussions, and more easily submit your assignments on Carmen. Additionally, this will protect against data loss if your computer malfunctions or gets lost or stolen.
- **Scientific rigor:** I understand that most of you are NOT scientists and are likely intimidated by a science GE course, and especially math/data analysis. However, while this course is a biology class and will require you to learn important scientific concepts, *this course is not designed to be difficult or onerous*. You will have to think critically and connect course concepts. You are all bright, capable and enthusiastic Buckeyes who belong to be here! *I have every confidence that you will succeed in this course and earn the grade that you want*.
- **Scheduling:** I will post the module for each week on Sundays at 12:00 am Eastern Time. The module page will contain the overview describing the week's tasks, readings, lab tutorial and laboratory activity/assignment. Assignments and Unit Assessments will be due the following Monday by 11:59 PM Eastern Time, giving you 10 days to complete the assignment.
- **Synchronous sessions:** During optional extra credit, synchronous Zoom sessions, I ask you to use your real name and a clear photo of your face. Please also use a clear picture of your face in your Carmen profile. When in breakout rooms or other small-



group discussions, having cameras and mics on as often as possible will help you get the most out of activities. You are always welcome to use the [free, Ohio State-themed virtual backgrounds](https://go.osu.edu/zoom-backgrounds) (go.osu.edu/zoom-backgrounds). Remember that Zoom and the Zoom chat are our classroom space where respectful interactions are expected.

- **Specific expectations for online discussions**
 - **Writing style:** While there is no need to complete your laboratory reports as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics, and especially in discussions.
 - **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. I will provide specific guidance for discussions on controversial or personal topics.
 - **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.
- **Statement of Intent:** By remaining in this course, you are agreeing to abide by the guidelines outlined in this syllabus. As instructors, we reserve the right to update and/or correct this syllabus. We will notify you should there be a necessary change to the syllabus.

Academic Integrity Policy

See [Descriptions of Major Course Assignments](#) for specific guidelines about collaboration and academic integrity in the context of this online class.

Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's [Code of Student Conduct](https://studentconduct.osu.edu) (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct,

so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- [Committee on Academic Misconduct](http://go.osu.edu/coam) (go.osu.edu/coam)
- [Ten Suggestions for Preserving Academic Integrity](http://go.osu.edu/ten-suggestions) (go.osu.edu/ten-suggestions)
- [Eight Cardinal Rules of Academic Integrity](http://go.osu.edu/cardinal-rules) (go.osu.edu/cardinal-rules)

Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. All PowerPoints and other instructional materials in this course are the intellectual property of the presenter and/or instructor. They are not to be shared beyond the course without the expressed written consent of the instructor(s). Recognizing that your work is also your intellectual property, we will not share or distribute your work without your permission.

Your 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. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](http://go.osu.edu/ccsondemand) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at [614- 292-5766](tel:614-292-5766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](http://suicidepreventionlifeline.org) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:1-800-273-8255). [The Ohio State Wellness app](http://go.osu.edu/wellnessapp) (go.osu.edu/wellnessapp) is also a great resource.

For CFAES students, David Wirt, wirt.9@osu.edu, is the CFAES embedded mental health counselor. He is available for new consultations and to establish routine care. To schedule with

David, please call 614-292-5766. Students should mention their affiliation with CFAES when setting up a phone screening.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Accessing the Writing Center

Many students struggle to clearly express their ideas in writing. Fortunately, the Writing Center offers free help with writing at any stage of the writing process for all students. During their sessions, consultants can work with you on anything from research papers to lab reports, from dissertations to résumés. Appointments are available in-person at 4120 Smith Lab, as well as for online. You may schedule an in-person or online appointment by visiting WC Online or by calling 614-688-4291. Please note that the Writing Center also offers daily walk-in hours—no appointment necessary—in Thompson Library. You do not have to bring in a piece of writing in order to schedule a writing center appointment. Many students report that some of their most productive sessions entail simply talking through ideas.

Diversity Statement

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/or to get involved, please visit:

- <https://odi.osu.edu/>
- <https://odi.osu.edu/racial-justice-resources>
- <https://odi.osu.edu/focus-on-racial-justice>
- <http://mcc.osu.edu/>

Principles of Community Statement

In addition, this course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environmental Sciences. These principles are located on the Carmen site for this course; and can also be found at <https://go.osu.edu/principlesofcommunity>. For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://equityandinclusion.cfaes.ohio-state.edu/>). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) at <https://equity.osu.edu/>.

Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](#). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services.

Disability Services Contact Information

- Phone: [614-292-3307](tel:614-292-3307)
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)

Accessibility of Course Technology

This online course requires use of CarmenCanvas (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 as early as possible.

- [CarmenCanvas accessibility](http://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](http://go.osu.edu/zoom-accessibility) (go.osu.edu/zoom-accessibility)

Course Schedule

Refer to the CarmenCanvas course for up-to-date due dates.

Course Theme	Course Week	Reading	Watching	Doing (Assignments)	
How do we know what we know?	1	The Syllabus	Lecture 00: Course Orientation	Complete Syllabus Assessment <i>Due Friday January 13th</i>	
				Optional Extra credit: Complete pre-course survey. <i>Due Friday January 13th</i>	
		Chapter 1: The Genesis of This Book	Lecture 01: Epistemologies: Different ways of knowing	Assignment 1: Critique an article about hope for its credibility. <i>Due Monday January 16th</i>	
	2	Optional Synchronous Study Session: Read and discuss short articles on American's distrust of science. DATE and time TBD			
		Chapter 20: Forming beliefs and How it is Done	Lecture 02: How beliefs are formed in childhood	Complete Quiz 1 <i>Due Friday January 20th</i>	
		Chapter 22: Don't Stop Believin' AND Chapter 23: Do You Believe in Magic?	Lecture 03: Receptivity to the Supernatural	Assignment 2: Differences between scientific and religious epistemologies <i>Due Monday January 23rd</i>	
		3	Previous lecture and reading notes	Optional Pre-recorded Synthesis Lecture: How and why can we have multiple ways of understanding our world?	Unit I Assessment: How we know what we know infographic. <i>Due Monday January 30th</i>
Humans and Animals: "Hopefully" we aren't so different	4	1. Kilman 2005 2. Dobzhansky	Lecture 04: The Finer points of Natural Selection	Complete Quiz 2 <i>Due Friday February 3rd</i>	
			Lecture 05: Pre-requisites for the biological basis of hope and belief	Assignment 3: Predict how animals would respond to climate change. <i>Due Monday February 6th</i>	



Course Theme	Course Week	Reading	Watching	Doing (Assignments)	
Humans and Animals: "Hopefully" we aren't so different	5	Chapter 5: How Neurons Work	Lecture 06: How neurons communicate	Complete Quiz 3. <i>Due Friday February 10th</i>	
		Chapter 4: Structure of the Nervous System	Lecture 07: Neurobiology basics	Assignment 4: Basic Neurobiology. <i>Due Monday February 13th</i>	
	6	Chapter 6: Neurobiology of Emotion	Lecture 08: Are emotions based in the brain?	Complete Quiz 4. <i>Due Friday February 17th</i>	
		Chapter 9: Is Music a Portal to the Divine?	Lecture 09: The strange case of music	Assignment 5: Evolutionary basis of music and relationship to hope <i>Due Mon Feb 20th</i>	
	7	Optional Synchronous Study Session: How do we discern what are real, shared emotions between humans and animals and what is anthropomorphism? Also provide anonymous feedback on the course by participating in a Small Group Instructional Discussion. Details will be posted on Carmen. Date and Time TBD			
		Chapter 11: Do Animals have Hope?	Lecture 10: Do animals have hope? Scientific experiments	Complete Quiz 5 <i>Due Friday February 24th</i>	
		Chapter 12: Hope in Animals	Lecture 11: Do animals have hope? Anecdotes from Dr. Barbara King TED talk and Clever Monkeys video	Optional extra credit: Provide feedback on the course in SGID and midterm survey. <i>Due Friday February 24th</i>	
				Assignment 6: Animal Intelligence and Emotion <i>Due Monday February 27th</i>	
	8	Reading and lecture notes as well as relevant, credible outside sources	Previous recorded lectures and assignment instructions.	Unit II Assessment: Socratic interview to teach a peer or family about the evidence that hope has a biological basis in humans and other animals <i>Due Monday March 6th</i>	



Course Theme	Course Week	Reading	Watching	Doing (Assignments)
Were hope and belief crucial elements during early human evolution?	9	Chapter 15: Evolution of Morality in Primates	Lecture 12: Morality in Great Apes	Complete Quiz 6 <i>Due Friday March 10th</i>
		Chapter 13: The Upright Ape: Evolution of the Brain and Bipedalism	Lecture 13: The upright ape: Evolution of the human brain and bipedalism	Assignment 7: Becoming Human <i>Due Monday March 20th</i>
		Spring Break! March 13 th – March 17 th		
	10	Chapter 17: The Selective Advantage of a Sacred Narrative	Lecture 14: Advantages of morality and a sacred narrative	Complete Quiz 7 <i>Due Friday March 24th</i>
		Chapter 18: Mental Criteria for Acquiring Religion & Chapter 19: Evidence for Religious Practice among Hunter-Gatherers	Lecture 15: Evolution of religion	Assignment 8: The Evolution of Religion <i>Due Monday March 27th</i>
	11	Reading and lecture notes as well as relevant, credible outside sources	Optional Pre-Recorded Synthesis Lecture: Weighing the evidence for and against the importance of hope, morality and belief in hunter gatherers	Unit III Assessment: Create a newsletter describing the evolutionary basis for altruism. <i>Due Monday April 3rd</i>



Course Theme	Course Week	Reading	Watching	Doing (Assignments)	
What are the benefits of hope and belief to modern humans and our society?	12	Chapter 8: The Neurochemistry of Hope	Lecture 16: Placebos and the Benedetti Experiments	Complete Quiz 8 <i>Due Friday April 7th</i>	
		Chapter 9: Serotonin and Artificial Hope	Lecture 17: Neurobiology of hope and hopelessness	Assignment 9: Placebos and Addiction. <i>Due Monday April 10th</i>	
	13	Optional synchronous study session: How do SSRI's and illicit drugs create artificial hope? Time TBD			
		Chapter 10: The Yin-Yang Relationship of Hope and Despair	Lecture 18: The balance between hope and despair	Complete Quiz 9 <i>Due Friday April 14th</i>	Optional extra credit: Random Acts of Hope <i>Due Friday April 14th</i>
		Chapter 27: Neurotheology	Lecture 19: What is neurotheology and what evidence supports it?	Assignment 10: Evolutionary Game Theory and Altruism <i>Due Monday April 17th</i>	
	14	Chapter 24: Spiritual Beliefs in the Brain	Lecture 20: Spiritual beliefs in the brain	Complete Quiz 10 <i>Due Friday April 21st</i>	Optional extra credit: Post-course evolution survey <i>Due Friday April 21st</i>
		Chapter 25: Is there a God Gene? The Heritability of Belief	Lecture 21: The genetic basis for belief	Assignment 11: Defining Hope <i>Due Monday April 24th</i>	
		Reading and lecture notes as well as relevant, credible outside sources	Optional Pre-Recorded Synthesis Lecture: What are the benefits of hope and belief to modern-day humans?	Unit IV Assessment: Write an essay discussing how hope and belief are beneficial to modern humans and our society. Due Friday April 28th	

IN LIEU OF A FINAL EXAM, STUDENTS WILL COMPLETE THE UNIT IV ASSESSMENT, WHICH COMBINES INFORMATION FROM UNIT IV AND OTHER PORTIONS OF THE CLASS. THIS ASSIGNMENT WILL OPEN ON SUNDAY, APRIL 16TH AND MUST BE COMPLETED BY 11:59 PM ON FRIDAY APRIL 28TH

NOTE: GRADUATING SENIORS MUST EMAIL DR. MEUTI AFTER SUBMITTING THEIR UNIT IV ASSESSMENT

GE Foundation Courses

Overview

Courses that are accepted into the General Education (GE) Foundations provide introductory or foundational coverage of the subject of that category. Additionally, each course must meet a set of Expected Learning Outcomes (ELO). Courses may be accepted into more than one Foundation, but ELOs for each Foundation must be met. It may be helpful to consult your Director of Undergraduate Studies or appropriate support staff person as you develop and submit your course.

This form contains sections outlining the ELOs of each Foundation category. You can navigate between them using the Bookmarks function in Acrobat. Please enter text in the boxes to describe how your class meets the ELOs of the Foundation(s) to which it applies. Because this document will be used in the course review and approval process, you should use language that is clear and concise and that colleagues outside of your discipline will be able to follow. Please be as specific as possible, listing concrete activities, specific theories, names of scholars, titles of textbooks etc. Your answers will be evaluated in conjunction with the syllabus submitted for the course.

Accessibility

If you have a disability and have trouble accessing this document or need to receive the document in another format, please reach out to Meg Daly at daly.66@osu.edu or call 614-247-8412.

GE Rationale: Foundations: Race, Ethnicity, and Gender Diversity (3 credits)

Requesting a GE category for a course implies that the course fulfills **all** the expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Race, Ethnicity, and Gender Diversity, please answer the following questions for each ELO.

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational for the study of Race, Ethnicity and Gender Diversity.

Course Subject & Number: _____

B. Specific Goals of Race, Ethnicity, and Gender Diversity

GOAL 1: Successful students will engage in a systematic assessment of how historically and socially constructed categories of race, ethnicity, and gender, and possibly others, shape perceptions, individual outcomes, and broader societal, political, economic, and cultural systems.

Expected Learning Outcome 1.1: Successful students are able to describe and evaluate the social positions and representations of categories including race, gender, and ethnicity, and possibly others. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.2: Successful students are able to explain how categories including race, gender, and ethnicity continue to function within complex systems of power to impact individual lived experiences and broader societal issues. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.3: Successful students are able to analyze how the intersection of categories including race, gender, and ethnicity combine to shape lived experiences. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.4: Successful students are able to evaluate social and ethical implications of studying race, gender, and ethnicity. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

GOAL 2: Successful students will recognize and compare a range of lived experiences of race, gender, and ethnicity.

Expected Learning Outcome 2.1: Successful students are able to demonstrate critical self- reflection and critique of their social positions and identities. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 2.2: Successful students are able to recognize how perceptions of difference shape one’s own attitudes, beliefs, or behaviors. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 2.3: Successful students are able to describe how the categories of race, gender, and ethnicity influence the lived experiences of others. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met.

GE Rationale: Foundations: Social and Behavioral Sciences (3 credits)

Requesting a GE category for a course implies that the course **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Social and Behavioral Sciences, please answer the following questions for each ELO.

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Social and Behavioral Sciences.

Course Subject & Number: _____

B. Specific Goals of Social and Behavioral Sciences

GOAL 1: Successful students will critically analyze and apply theoretical and empirical approaches within the social and behavioral sciences, including modern principles, theories, methods, and modes of inquiry.

Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of social and behavioral science. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.2: Successful students are able to explain and evaluate differences, similarities, and disparities among institutions, organizations, cultures, societies, and/or individuals using social and behavioral science. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

GOAL 2: Successful students will recognize the implications of social and behavioral scientific findings and their potential impacts.

Expected Learning Outcome 2.1: Successful students are able to analyze how political, economic, individual, or social factors and values impact social structures, policies, and/or decisions. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of social scientific and behavioral research. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the social and behavioral sciences. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

GE Rationale: Foundations: Historical or Cultural Studies (3 credits)

Requesting a GE category for a course implies that the course fulfills the expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Historical and Cultural Studies, please answer the following questions for each ELO. Note that for this Foundation, a course need satisfy either the ELOs for Historical Studies or the ELOs for Cultural Studies.

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of History **or** Cultures.

Course Subject & Number: _____

B. Specific Goals of Historical *or* Cultural Studies

Historical Studies (A) Goal: Successful students will critically investigate and analyze historical ideas, events, persons, material culture and artifacts to understand how they shape society and people.

Expected Learning Outcome 1.1A: Successful students are able to identify, differentiate, and analyze primary and secondary sources related to historical events, periods, or ideas. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.2A: Successful students are able to use methods and theories of historical inquiry to describe and analyze the origin of at least one selected contemporary issue. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.3A: Successful students are able to use historical sources and methods to construct an integrated perspective on at least one historical period, event or idea that influences human perceptions, beliefs, and behaviors. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.4A: Successful students are able to evaluate social and ethical implications in historical studies. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Cultural Studies (B) Goal: Successful students will evaluate significant cultural phenomena and ideas to develop capacities for aesthetic and cultural response, judgment, interpretation, and evaluation.

Expected Learning Outcome 1.1B: Successful students are able to analyze and interpret selected major forms of human thought, culture, ideas or expression. Please link this ELO to the course goals and topics and identify the *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.2B: Successful students are able to describe and analyze selected cultural phenomena and ideas across time using a diverse range of primary and secondary sources and an explicit focus on different theories and methodologies. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.3B: Successful students are able to use appropriate sources and methods to construct an integrated and comparative perspective of cultural periods, events or ideas that influence human perceptions, beliefs, and behaviors. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.4B: Successful students are able to evaluate social and ethical implications in cultural studies. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met.

GE Rationale: Foundations: Writing and Information Literacy (3 credits)

Requesting a GE category for a course implies that the course fulfills **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Writing and Information Literacy, please answer the following questions for each ELO.

Course Subject & Number: _____

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Writing and Information Literacy.

B. Specific Goals of Writing and Information Literacy

GOAL 1: Successful students will demonstrate skills in effective reading, and writing, as well as oral, digital, and/or visual communication for a range of purposes, audiences, and context.

Expected Learning Outcome 1.1: Successful students are able to compose and interpret across a wide range of purposes and audiences using writing, as well as oral, visual, digital and/or other methods appropriate to the context. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. Explain how the course includes opportunities for feedback on writing and revision. Furthermore, please describe how you plan to insure sufficiently low instructor-student ratio to provide efficient instruction and feedback. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.2: Successful students are able to use textual conventions, including proper attribution of ideas and/or source, as appropriate to the communication situation. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. Is an appropriate text, writing manual, or other resource about the pedagogy of effective communication being used in the course? (50-700 words)

Expected Learning Outcome 1.3: Successful students are able to generate ideas and informed responses incorporating diverse perspectives and information from a range of sources, as appropriate to the communication situation. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.4: Successful students are able to evaluate social and ethical implications in writing and information literacy practices. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

GOAL 2: Successful students will develop the knowledge, skills, and habits of mind needed for information literacy.

Expected Learning Outcome 2.1: Successful students are able to demonstrate responsible, civil, and ethical practices when accessing, using, sharing, or creating information. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 2.2: Successful students are able to locate, identify and use information through context appropriate search strategies. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 2.3: Successful students are able to employ reflective and critical strategies to evaluate and select credible and relevant information sources. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

GE Rationale: Foundations: Literary, Visual, or Performing Arts (3 credits)

Requesting a GE category for a course implies that the course fulfills **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Literary, Visual, and Performing Arts, please answer the following questions for each ELO.

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Literary, Visual, or Performing Arts.

B. Specific Goals

Goal 1: Successful students will analyze, interpret, and evaluate major forms of human thought, cultures, and expression; and demonstrate capacities for aesthetic and culturally informed understanding.

Expected Learning Outcome 1.1: Successful students are able to analyze and interpret significant works of design or visual, spatial, literary or performing arts. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.2: Successful students are able to describe and explain how cultures identify, evaluate, shape, and value works of literature, visual and performing art, and design. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.3: Successful students are able to evaluate how artistic ideas influence and shape human beliefs and the interactions between the arts and human perceptions and behavior. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.4: Successful students are able to evaluate social and ethical implications in literature, visual and performing arts, and design. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Goal 2: Successful students will experience the arts and reflect on that experience critically and creatively.

Expected Learning Outcome 2.1: Successful students are able to engage in informed observation and/or active participation within the visual, spatial, literary, or performing arts and design. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 2.2: Successful students are able to critically reflect on and share their own experience of observing or engaging in the visual, spatial, literary, or performing arts and design.

Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

GE Rationale: Foundations: Natural Science (4 credits)

Requesting a GE category for a course implies that the course fulfills **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Natural Sciences, please answer the following questions for each ELO.

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Natural Science.

Course Subject & Number: _____

B. Specific Goals for Natural Sciences

GOAL 1: Successful students will engage in theoretical and empirical study within the natural sciences, gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.

Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.2: Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.3: Successful students are able to employ the processes of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models, and analysis of data. Please explain the 1-credit hour equivalent experiential component included in the course: e.g., traditional lab, course-based research experiences, directed observations, or simulations. Please note that students are expected to analyze data and report on outcomes as part of this experiential component. *(50-1000 words)*

Course Subject & Number: _____

GOAL 2: Successful students will discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.

Expected Learning Outcome 2.1: Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of natural scientific discoveries. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the natural sciences. Please link this ELO to the course goals and topics and indicate *specific* activities/ assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

GE Rationale: Foundations: Mathematical and Quantitative Reasoning (or Data Analysis) (3 credits)

Requesting a GE category for a course implies that the course fulfills **all** expected learning outcomes (ELOs) of that GE category. To help the reviewing panel evaluate the appropriateness of your course for the Foundations: Mathematical and Quantitative Reasoning (or Data Analysis), please answer the following questions for each ELO.

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Mathematical & Quantitative Reasoning (or Data Analysis).

B. Specific Goals for Mathematical & Quantitative Reasoning/Data Analysis

Goal: Successful students will be able to apply quantitative or logical reasoning and/or mathematical/statistical analysis methodologies to understand and solve problems and to communicate results.

Expected Learning Outcome 1.1: Successful students are able to use logical, mathematical and/or statistical concepts and methods to represent real-world situations. Please link this ELO to the course goals and topics and indicate *specific* activities/ assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.2: Successful students are able to use diverse logical, mathematical and/or statistical approaches, technologies, and tools to communicate about data symbolically, visually, numerically, and verbally. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.3: Successful students are able to draw appropriate inferences from data based on quantitative analysis and/or logical reasoning. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course Subject & Number: _____

Expected Learning Outcome 1.4: Successful students are able to make and evaluate important assumptions in estimation, modeling, logical argumentation, and/or data analysis. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Expected Learning Outcome 1.5: Successful students are able to evaluate social and ethical implications in mathematical and quantitative reasoning. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)