Term Information

Effective Term	Spring 2016
Previous Value	*Spring 2015*

Course Change Information

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

Eliminate the prerequisites of 'one biological or physical science course' and 'soph. standing' and 'or permission of instructor'.

This will leave 'Honors standing' as the sole prerequisite.

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

Enable enrollment of entering freshmen (course is for non-majors so prerequisites would likely deter some students unnecessarily).

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. Course is not per se a designated requirement for any particular program (it is GEC).

Is approval of the requrest 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	2400H
Course Title	Evaluating Evidence in Biology & Medicine
Transcript Abbreviation	Evaluate Evidence
Course Description	Explores information and scientific literacies in biology and medicine, with emphasis on science as reported in the media and the use of insects and other organisms as model systems. We use evolutionary theory as the unifying framework for all life on earth. The ability to scrutinize science as reported in popular sources and to procure additional, credible information is emphasized.
Semester Credit Hours/Units	Fixed: 3

Offering Information

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

Prerequisites and Exclusions

Prerequisites/Corequisites	Prereq: Honors standing.
Previous Value	*Prereq: Honors standing, one biological or physical science course, and Soph standing; or permission of instructor.*
Exclusions	

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	26.0702
Subsidy Level	Baccalaureate Course
Intended Rank	Sophomore, Junior, Senior

Requirement/Elective Designation

General Education course:
Biological Science

Course Details

Course goals or learning objectives/outcomes

- Expected Learning Outcomes: Biological Science

  1. Students understand the basic facts, principles, theories and methods of modern science.
- 2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
- 3. Students describe the inter-dependence of scientific and technological developments.
- 4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.
- Expected Learning Outcomes: Information Literacy

  1. Students locate, contextualize and assess information and content from different sources (e.g. scholarly, OER, user-generated)
- 2. Students contrast nature of scientific information found in textbooks vs review articles vs primary articles; evaluate sources & authors
- 3. Students locate a current, primary source and a related, “classic” source, and explain how technology has advanced current understanding of the subject area
- 4. Students obtain and evaluate information from various reliable sources (e.g., newspapers, government websites, primary and secondary research articles)

Content Topic List

- Week 1

  Course Overview: goals, learning outcomes, activities, policies

  Other “ways of knowing”-- the arts, humanities, religion, etc.

- Week 2

  Science as a way of knowing: empiricism, hypotheses, models, peer-review, corroboration; pseudoscience

  Terminology: theories vs laws, probability vs uncertainty, correlation vs causation, statistical significance, graphs.

- Week 3

  Information Literacy: Using OSU Libraries e-databases

  Evolutionary theory as paradigm: Before vs since Darwin, recognizing evolution as the unifying principle for all life forms, extinct & living, including Homo sapiens

- Week 4

  Do vitamin C and other antioxidants benefit health? Using observations & experiments to test medical hypotheses

  “Feeling detoxified”-- Case study on placebo effect: spa claims that ionic foot bath removes toxins from the body

- Week 5

  Exam #1: discussion of answers (posted by groups in week 4)

  Evaluating the credibility and authority of scientists

- Week 6

  New York Times Tuesday Science: discussion of selected article

  Police dogs smelling criminals? Testing behavioral hypotheses

- Week 7

  Why are frogs in trouble? Complementary observations and experiments to test hypotheses in ecology

- Week 8

  How do animals find stored food? Strong inference by testing alternative hypotheses

- Week 9

  What causes cancer? The complexities of causation

- Week 10

  Exam #2: discussion of answers (posted by groups in week 9)

- Week 11

  New York Times Tuesday Science: Students report on articles of their choice

  How does coffee affect health? Results of multiple studies

- Week 12

  Immunization and vaccination: facts, myths; “herd immunity”

  Case Study: Sex and vaccination— Texas tempest over HPV

- Week 13

  Case Study: Sex and vaccination— current status; resolution

  Wrapping up: The role of science in society

- Week 14

  Science today: funding sources, where scientists work

  New York Times Tuesday Science: Students report on articles of their choice

- Week 15

Final Exam (Cumulative): Emphasis on applying skills & scientific understanding to explain and evaluate science-based information

Attachments

- ENTMLGY 2400H SYLLABUS 5 Feb 2015 Spr 2015.pdf: revised syllabus

(Syllabus. Owner: Welty,Celeste)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Welty,Celeste	02/06/2015 03:52 PM	Submitted for Approval
Approved	Welty,Celeste	02/10/2015 09:48 AM	Unit Approval
Approved	Neal,Steven Michael	02/10/2015 10:13 AM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler Hogle,Danielle Nicole	02/10/2015 10:13 AM	ASCCAO Approval

"Evaluating Evidence in Biology & Medicine"

Instructor:	Dr. Carol Anelli, in collaboration with Mr. Craig Gibson
Course:	ENTMLGY 2400H
Prerequisite:	Honors standing
GE category:	Natural Science/Biological Science
Credits/Delivery:	3 cr/Interactive recitation with discussion
Time/Location:	Tues & Thurs 9:35-10:55 AM/201 Kuhn
Office Hours:	By appointment: email anelli.7@osu.edu

Course Overview

This course explores information and scientific literacies in biology and medicine, with emphasis on science as reported in the media and the use of insects and other organisms as model systems. It makes use of evolutionary theory as the unifying framework for all life on earth from about 3.8 billion years ago to the present. It also hones skills for life: the ability to scrutinize science as reported in various popular sources and to procure additional, credible information if desired.

We begin with an understanding of science as a process ("way of knowing") and evolution as a utilitarian, evidence-based, predictive theory. To acquire needed foundational knowledge we will discuss different science methodologies, interpret data and evidence, evaluate sources and scientific credentials, examine science in the context of health and well being, and weigh the pros and cons of controversial findings and issues to render informed decisions. In a final case study on human vaccination we will explore a science-based, complex contemporary issue that illustrates ethical concerns and difficult choices faced by people in their personal lives and as citizens of a democracy.

General Education: Natural Science

Goals**:** Students understand the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

Expected Learning Outcomes: Biological Science

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
3. Students describe the inter-dependence of scientific and technological developments.
4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

Expected Learning Outcomes: Information Literacy

1. Students locate, contextualize and assess information and content from different sources (e.g. scholarly, OER, user-generated)
2. Students contrast nature of scientific information found in textbooks *vs* review articles *vs* primary articles; evaluate sources & authors
3. Students locate a current, primary source and a related, "classic" source, and explain how technology has advanced current understanding of the subject area
4. Students obtain and evaluate information from various reliable sources (e.g., newspapers, government websites, primary and secondary research articles)

Required Materials

- Textbook: *How Science Works: Evaluating Evidence in Biology and Medicine*. 2004. S.H. Jenkins. Oxford University Press, New York. 227 pp. This text provides a brief historical perspective for most chapter themes and references to classic papers. The narrative is augmented with data as tables and graphs.
- Newspaper: *The New York Times Tuesday Science Section* (OSU Libraries)
- Essays and articles: Selected by instructor [listed in syllabus, posted at Carmen]
- Podcasts, YouTube videos: Selected by instructor (e.g., Science Times, Science Talk, and Science) [links posted at Carmen]

Note: Podcast interviews with scientists and science journalists ("Science Talk" from *Scientific American*, "Science Times" from *New York Times*, "Science" from *Science*), YouTube videos, and related prompts will be posted at Carmen.

Required Assignments & Point Allocations

Homework (ungraded; brief written responses to readings, podcasts, YouTube videos)	5%
Library homework	5%
Attendance, participation, team work	10%
Response to Discussion Prompts (written; posted periodically at Carmen)	5%
Group Take-home Exam #1	15%
Group Take-home Exam #2	15%
Final Case Study (written with small group, approx. 4 students/group)	15%
New York Times Article Report (three total)	12%
Final Exam (cumulative)	18%
TOTAL	100%

Course Outline (Spring 2015)

Wk	Theme	Day and Topic *Note: To prepare for class discussion, students will complete assigned readings and respond to prompts at Carmen before class*	Readings Jenkins Textbook	*NYT* & Additional Sources
1	Science Basics	Tu Course Overview: goals, learning outcomes, activities, policies Th Other "ways of knowing"-- the arts, humanities, religion, etc.	Ch 1	syllabus
2		Tu Science as a way of knowing: *empiricism, hypotheses, models, peer-review, corroboration; pseudoscience* Th Terminology: *theories vs laws, probability vs uncertainty, correlation vs causation, statistical significance, graphs*		Gillen Loomis Mayr Greenspan
3		Tu Information Literacy: *Using OSU Libraries e-databases* Th Evolutionary theory as paradigm: *Before vs since Darwin, recognizing evolution as the unifying principle for all life forms, extinct & living, including Homo sapiens*		Gibson Nesse, Shubin, Mindell
4	Science Methodologies in Current Contexts	Tu Do vitamin C and other antioxidants benefit health? *Using observations & experiments to test medical hypotheses* Th "Feeling detoxified"-- *Case study on placebo effect: spa claims that ionic foot bath removes toxins from the body*	Ch 2	McCallam & Prud'homme-Généreux
5		Tu **Exam #1**: discussion of answers (posted by groups in week 4) Th Evaluating the credibility and authority of scientists		Anelli
6		Tu *New York Times Tuesday Science*: discussion of selected article Th Police dogs smelling criminals? *Testing behavioral hypotheses*	Ch 3	NYT Gawande 1
7		Tu & Th Why are frogs in trouble? *Complementary observations and experiments to test hypotheses in ecology*	Ch 4	Blaustein
8		Tu & Th How do animals find stored food? *Strong inference by testing alternative hypotheses*	Ch 5	
9		Th & Th What causes cancer? *The complexities of causation*	Ch 6	Gawande 2
10		Tu **Exam #2**: discussion of answers (posted by groups in week 9) Th No class-- Dr. Anelli at scientific conference		
11		Tu *New York Times Tuesday Science*: Students report on articles of their choice Th How does coffee affect health? *Results of multiple studies*	Ch 8	NYT
12	Science & Society	Tu Ecosystems: Structure, function, processes; energy & matter flow Th Case Study: Reintroduction of wolves into Greater Yellowstone Ecosystem		Misconcepts; White & Garrott; NPS
13		Tu Case Study: Wolves in Yellowstone— current status; resolution Th Wrapping up: The role of science in society		White & Garrott
14		Tu Science today: *funding sources, where scientists work* Th *New York Times Tuesday Science*: Students report on articles of their choice	Ch 10	Augustine NYT
15		Final Exam (Cumulative): Emphasis on applying skills & scientific understanding to explain and evaluate science-based information		

Grading Policies

Homework assignments that are ungraded (1 pt each) must be complete and represent "good faith" efforts for the assignment. *New York Times* article reports (see below) are graded per the rubric (posted at Carmen with a model report). Answers to the Final Case Study questions will be graded for accuracy and completeness (rubric will be posted).

Group work (two midterm, group take-home exams plus the final case study) will be evaluated on quality of answers as well as teamwork. For elements of good teamwork, see forms for self and peer evaluation (attached), which are required for all group work.

Group Assignments ("Group Contract" is attached for perusal)

The instructor will assign student groups, each to comprise about 4 students. Each group will devise a Group Contract, i.e., a written plan for the assignment, which will be signed by all group members and submitted to the instructor. By signing the Contract, group members indicate their intention to adhere to the written plan and to act in accord with the behaviors and responsibilities stated in the Contract.

Dissension Document (attached)

Groups comprise 3-5 students; any student may opt to disagree with his/her group's answer. If a student disagrees with the group's answer and provides the CORRECT ANSWER, said student will earn the appropriate points (and the group will not). If a student dissents and provides an INCORRECT answer, the student will lose points accordingly.

How to dissent: A student will provide his/her dissent in a document with a brief but complete justification for an alternate answer. The student will post the dissent document to the group's Carmen site, indicating his/her name with the word "DISSENT." If more than two students decide to dissent and wish to provide the same answer, it may be posted as a single dissension, but the document must indicate clearly the names of the dissenting students.

Grading Scale

A	93-100%	C	74-76
A^-	90-92	C^-	70-73
B^+	87-89	D^+	67-69
B	84-86	D	64-66
B^-	80-83	E	< 64
C^+	77-79		

New York Times (NYT) Article Reports

We will discuss current NYT articles from the Tuesday Science Section in class three times during the semester; students will summarize three NYT articles per the NYT Article Report template (attached). We will discuss and model this assignment in-class. Each NYT written and oral report will contribute 4% toward the final grade, for a total of 12%.

Attendance, Participation, and Late Work Policy

Students should plan to attend all classes. If a class is missed, the student must notify Dr. Anelli *before* class and provide a reason for the absence. Students should also accept the responsibility to meet with an informed, engaged student (not Dr. Anelli) to learn what occurred in class, what assignments may have been discussed, etc.

All assignments and exams are *due at the beginning of class*; late work is subject to grade reduction of 10% each day it is late. All completed assignments must be posted to the course's Carmen site. Individual groups will be assigned online space that is accessible only to members of a given group.

Academic Misconduct Statement

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

Academic Disabilities Statement

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.ohio-state.edu/.

Welcome to the course!

I look forward to working and learning with you!

Sources

Anelli, C. 2011. Major criteria for evaluation of science authors. http://libguides.wsulibs.wsu.edu/content.php?pid=108535&sid=3017961

Blaustein, A.R., and Kiesecker, J.M. 2002. Complexity in conservation: Lessons from the global decline of amphibian populations. *Ecol. Lett*. 5:597-608.

Gawande, A. 2001. Under suspicion: The fugitive science of criminal justice. *New Yorker,* Jan issue, p. 50.

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Misconceptions: Using the power of story. 2014. Overcoming Ecological Misconceptions, http://ecomisconceptions.binghamton.edu/index.htm

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Nesse, R.M. and Stearns, S.C. 2008. The great opportunity: evolutionary applications to medicine and public health. *Evolutionary Applications* 1:28-48.

Shubin, N.H. 2009. This old body. *Scientific American* Jan issue: 64-67.

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White, P.J. and Garrott, R.A> 2005. Yellowstone's ungulates after wolves: Expectations, realizations and predictions. *Biological Conservation* 125: 141–152.

WSU Libraries. Undated. Evaluating Sources: The CRAAP Test. http://libguides.wsulibs.wsu.edu/content.php?pid=108535&sid=816820

WSU Libraries. Undated. Information Literacy Research Skill Building (tutorials). http://libguides.wsulibs.wsu.edu/search.php?iid=984&c=0&gid=340&pid=108535&search=information%20literacy%20research