Term Information

Effective Term	Spring 2017

General Information

Course Bulletin Listing/Subject Area	Biology
Fiscal Unit/Academic Org	Introductory Biology - D0326
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	2367
Course Title	Biology and Society
Transcript Abbreviation	Biology & Society
Course Description	A writing-intensive course in which students analyze biological principles to cooperatively research, develop and communicate positions for societal action to address biological problems of the contemporary world.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week, 12 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	Recitation, Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites	1101 (101), or 1102 (102), or 1113 (113) and 1114 (114), and Eng 1110, and Soph standing or above
Exclusions	

Cross-Listings

Cross-Listings

Subject/CIP Code

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

Requirement/Elective Designation

General Education course:
Level 2 (2367); Biological Science

Course Details

Course goals or learning objectives/outcomes

- Apply, analyze, and synthesize the basic facts, principles, theories and methods of modern biology.
- Use quantitative reasoning to evaluate scientific claims and articulate a position on a currently relevant scientific topics using validated scientific information.
- Find and evaluate sources of reliable scientific information related to primary and secondary literature in relevant biological and aligned disciplines.
- Work in a group to formulate societal policy options addressing currently relevant scientific topics of opportunity or concern.
- Demonstrate through critical analysis, discussion, and written work the ability to communicate a scientific idea effectively to peers from a diverse range of disciplines and interests.
- Effectively deliver an oral presentation demonstrating ability to communicate a complex scientific concept.
- Improve and build upon one's written work based on feedback provided by instructors and peers.
- Identify societal impacts of biological advancements.
- Evaluate the impact of technological developments on society and their consequences.

Content Topic List

- Writing skills
- Scientific writing
- Antibiotic resistance
- Biodiversity
- Cancer
- Biodiversity
- Climate change
- Genetically modified organisms
- Stem cells / cloning

Attachments

- Proposal to Create Biology 2367 – Biology and Society.docx: Course Proposal

  (Cover Letter. Owner: Andrews,Adam Lee)
- Biology 2367 Assessment Plan.docx: Assessment Plan

  (GEC Course Assessment Plan. Owner: Andrews,Adam Lee)
- Biology 2367 Sample Syllabus.docx: Syllabus

  (Syllabus. Owner: Andrews,Adam Lee)
- Biology 2367 GE Justification.docx: GE Justification

  (Other Supporting Documentation. Owner: Andrews,Adam Lee)

Comments

- The plan to offer a distance learning version was preemptive for some time in the future. I will withdraw the request for that version of the course at this time. *(by Andrews,Adam Lee on 03/18/2016 10:17 AM)*
- If this course will sometimes be taught 100% on-line, please work with Mike Kaylor (ASCTech). Information on Distance Learning requests is here: http://asccas.osu.edu/distance-learning-courses After you have worked with Mike, please upload distance learning syllabus and the completed technical review checklist in curriculum.osu.edu *(by Vankeerbergen,Bernadette Chantal on 03/15/2016 08:45 AM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Andrews,Adam Lee	03/09/2016 01:48 PM	Submitted for Approval
Approved	Misicka,Matthew Alan	03/09/2016 02:11 PM	Unit Approval
Approved	Fink,Steven Scott	03/10/2016 08:09 AM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	03/15/2016 08:46 AM	ASCCAO Approval
Submitted	Andrews,Adam Lee	03/18/2016 10:17 AM	Submitted for Approval
Approved	Haddad,Deborah Moore	03/18/2016 12:02 PM	Unit Approval
Approved	Fink,Steven Scott	03/18/2016 03:02 PM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler Hogle,Danielle Nicole	03/18/2016 03:02 PM	ASCCAO Approval

Proposal to Create *Biology 2367 – Biology and Society*
3 credit hours

Catalog Description: A writing-intensive course in which students analyze biological principles to cooperatively research, develop and communicate positions for societal action to address biological problems of the contemporary world.

In an op-ed in the Los Angeles Times in 2000, Dr. Craig Venter, who led the effort to sequence the human genome, famously claimed that, "If the 20th century was the century of physics, the 21st century will be the century of biology." One year later, Congress passed and President George W. Bush signed the No Child Left Behind act that effectively required every state to develop K-12 education standards, including those for science content. As a result of this and subsequent legislation, especially at the state level, virtually every student matriculating at an American college or university today has taken at least three basic science courses in middle and high school. No longer must today's colleges and universities introduce every entering student to potentially novel fields like the sciences. Rather, General Education science courses can and should prepare college graduates to fulfill their responsibilities as scientifically literate citizens in our democracy. Accordingly, we propose a post-introduction biology course that facilitates the development of undergraduate reasoning skills through the cooperative learning exercise of developing and communicating in writing and presentations policy positions that address biological problems of the contemporary world.

Science, particularly in the field of Biology, is advancing so rapidly that it is not surprising the general public struggles to keep up, much less understand. Society as a whole is often slow to accept scientific discoveries, particularly in the United States. As we must recognize that the general public are the voters who elect policy makers, it behooves us to ensure that our students are given the skills to not only comprehend the ever-changing scientific discoveries of the day, but to research an issue and effectively communicate a position on that issue. To that end, we are proposing to create a Biology Level 2 Writing Course with an issue focus. Our intent is to capitalize on core foundational material general education students learn in our introductory courses and further that learning with enhanced abilities in communication of those topics. The course will employ a case studies approach, providing rich opportunities for students to discover the methods of modern science, recognize that science is an evolving body of knowledge, describe the inter-dependence of scientific and technological developments, recognize the social and philosophical implications of scientific discoveries, and understand the potential of science and technology to address problems of the contemporary world. The case studies approach will also facilitate our goal of helping our students to learn communication skills. Sample topics include cancer, genetically modified organisms, climate change, cloning, biodiversity, and antibiotic resistance. A unifying theme of the course will be the scientific literacy needed to effectively communicate difficult scientific topics to individuals outside of scientific disciplines: a goal valuable to both science and non-science majors.

The case studies approach will also provide instructors flexibility to address topics relevant to students and of interest to them, thereby expanding the range of faculty members interested in offering sections of the course in the future. It is our hope that this flexibility will recruit faculty to present the course. We envision eventually having a group of instructors at the main and regional campuses sharing case study ideas and materials and keeping the course current and relevant, as we do with other courses offered by the CLSE. One of the draws for

faculty to teach upper level courses is the freedom to create content of their own interest, as opposed to the broad outcomes and topics required in the broad survey introductory courses. The intended structure of this course offers some level of incentive.

We intend that this course meet General Education requirements for two areas: *Natural Sciences* and *Level Two Writing and Communication*. The General Education Natural Science requirements will be fulfilled as follows. The lecture material and topical research will illustrate the principles of modern science. The topics and course structure will provide opportunities to examine the development of scientific insights and idea, e.g. from Mendelian genetics, to the discovery of chromosomes, to the identification of DNA as the genetic material, to the discovery of the structure and function of DNA, to the application of these insights into genetically based medicine and genetically modified organisms or GMOs. The survey nature of many introductory courses often preclude such opportunities to examine how currently relevant issues (e.g. use of GMOs) first began. The applied nature of scientific discoveries leads to technology, which in turn leads to the heart of the course. We aim to have students understand the implications of the scientific discoveries on society. We have structured the entire course and its components to focus on the historical develop of a few core ideas, how those ideas pose opportunities and possible risks for society today and a consideration of the types of policy ideas necessary to develop and regulate it.

The Level Two Writing and Communication requirement will be met with policy papers. The writing of the policy paper will involve an iterative approach to writing, with individual and group components. Trained instructors and peers will provide feedback on draft papers at several stages in their development. The collaborative group approach meets our learning goals in multiple ways. Not only do cooperative groups provide built-in peer review opportunities, but it also increases diversity of perspectives on case topics such as antibiotic resistance and global climate change. By intentionally assembling our cooperative groups to maximize diversity (using information on the class roster: year, major, and gender) we intend to facilitate opportunities for our students to hear viewpoints alternative to theirs and to clarify and defend their own views, especially when they are at variance with their group mates. We have had success with this approach in other CLSE courses and find it generates much more opportunity to compare and evaluate divergent. In addition to the internal peer review within the group, we will also plan for peer reviews among working groups in each recitation. The development of the issue papers will have students research a biological concept, formulate a position, and express it effectively to someone without a scientific background. This approach requires the ability to uncover the most salient points of an issue and deliver them clearly thus indicating deep understanding of the topic. Students will develop their positions/papers by searching relevant primary, secondary, and popular media depending upon the information needed and the positions taken. For example, to understand the difficulty inherent in proposing a particular position on Global Climate Change, students may need to examine newspapers, blogs, and other digital resources. We will expect students to include effective visual elements in their written presentation, whether original or well-chosen from the literature.

Each student in the course will make an oral presentation providing an opportunity to practice and improve oral communication skills. Students will present during one of the three topic modules and will provide a short presentation on their position for that topic. An opportunity for peers and the instructor will follow each presentation. Instructors will provide feedback on the quality of the presentation and the student's ability to provide a solid justification of the position they present.

We will use multiple assessment methods to ensure that students achieve our learning outcomes. We will measure quantitatively, the core scientific principles and success of student writing using analytic rubrics to gauge student effectiveness at communicating the topic, improvement based on feedback, accuracy of scientific understanding, and ability to think critically. Qualitatively, we will use the Student Assessment of Learning Gains (SALG) at the end of the course. This survey will ask students to respond to a series of Likert and open-ended questions about the gains made in each of the General Education outcomes as well as the course outcomes. This tool has been implemented in all CLSE courses for nearly a decade, providing us with a wealth of assessment data that has been critical to our improvement of courses and instructor professional development.

The course will include a lecture component taught by a faculty member. The lecture will meet for 110 minutes each week, initially as a section of 50-100 students, though scalable to larger capacities. Teaching Associates will lead required recitation sections of 20-24 students that meet once per week for 80 minutes. This number can effectively divide students into working groups of 4 while providing a manageable grading load for the TA. While initially we are proposing only a face-to-face offering of this course, we envision the possibility of future offerings in a distance learning environment. New technology, especially Canvas, is making the collaboration necessary for achieving our outcomes a reality while not degrading the learning environment.

The Center for Life Sciences Education is proud of our professional development opportunities aimed at the instructors of all levels who teach with us, from Undergraduate and Graduate Teaching Associates to Lecturers and Professors. For Teaching Associates assigned to this course, we will require a series of workshops before or at the beginning of the course aimed at effective grading and feedback on writing assignments. These workshops will be in addition to the ongoing training throughout the course that will come in the form of weekly staff meetings, observation, feedback on grading.

Appendix A: Natural Science Learning Outcomes and Justification
(*See Attached*)

Appendix B: Biology 2367 Course Learning Objectives
(*See Attached*)

Appendix C: Assessment Plan
(*See Attached*)

Appendix D: Sample Issue Paper Rubric
(*See Attached*)

Appendix E: Sample Course Syllabus
(*See Attached*)

Appendix A: Natural Science Learning Outcomes and Justification

Natural (Biological) 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:

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.

Level Two Writing and Communication Goals:
Students are skilled in written communication and expression, reading, critical thinking, oral expression and visual expression.

Expected Learning Outcomes:

1. Through critical analysis, discussion, and writing, students demonstrate the ability to read carefully and express ideas effectively.
2. Students apply written, oral, and visual communication skills and conventions of academic discourse to the challenges of a specific discipline.
3. Students access and use information critically and analytically.

Students in Biology 2367 will achieve the natural science objectives through an investigation of applied scientific methods and discoveries, the evolving nature of which have led to technological developments. Students will be introduced to the concepts of a series of case studies involving discoveries in current biological and applied literature, and it will be up to students to work collaboratively with peers to research the topic, recognize the societal implications, and develop issue statements to promote management or restrict the use of those technologies. The iterative writing process will promote student communication skills through regular feedback on writing and oral presentations, while the required collaboration with peers will allow students the opportunity to engage in academic discourse and peer review in these current biological topics.

Appendix B: Course Learning Outcomes

To demonstrate scientific literacy, successful students in the course will be able to:

1. Apply, analyze, and synthesize the basic facts, principles, theories and methods of modern biology.
2. Use quantitative reasoning to evaluate scientific claims and articulate a position on a currently relevant scientific topics using validated scientific information.
3. Find and evaluate sources of reliable scientific information related to primary and secondary literature in relevant biological and aligned disciplines.
4. Work in a group to formulate societal policy options addressing currently relevant scientific topics of opportunity or concern.
5. Demonstrate through critical analysis, discussion, and written work the ability to communicate a scientific idea effectively to peers from a diverse range of disciplines and interests.
6. Effectively deliver an oral presentation demonstrating ability to communicate a complex scientific concept.
7. Improve and build upon one's written work based on feedback provided by instructors and peers.
8. Identify societal impacts of biological advancements.
9. Evaluate the impact of technological developments on society and their consequences.

Appendix C: Assessment Plan

GE Expected Learning Outcomes	**Methods of Assessment** **Direct methods are required. Additional Indirect methods are encouraged.*	**Level of student achievement expected for the GE ELO.** *(for example define percentage of students achieving a specified level on a scoring rubric)*	**What is the process that will be used to review the data and potentially change the course to improve student learning of GE ELOs?**
Writing and Communication Level 2			
ELO 1 Through critical analysis, discussion, and writing, students demonstrate the ability to read carefully and express ideas effectively	• The position paper for the first and third module will use an analytic rubric with specific line items addressing the quality of written communication. (*See paper objectives 1, 2, 5, 6, 9, 10, 11, and 12)* • The short paper will also use a similar rubric.	We will expect students to achieve on average a 70% score on an analytic rubric associated with each paper to be considered to have achieved this outcome.	Data from the Student Assessment of Learning Gains survey will be reviewed, in conjunction with data pulled from the scores on line items of the paper rubric criteria. Based on this data, we will discuss what happened, what went well, and what we want to work on. This will allow for a data-driven plan for future offerings.
ELO 2 Students apply written, oral, and visual communication skills and conventions of academic discourse to the challenges of a specific discipline.	• The position paper for the first and third module and short paper will use an analytic rubric with specific line items addressing the efficacy of written communication. (*See paper objectives 1, 2, 6, and 7)* • The oral presentation will assess the quality of presentation and ability to present a position clearly with justification.		
ELO 3 Students access and use information critically and analytically	• A line of the position paper rubric will address the source of information used and the level of critical thinking presented in the paper. (*See paper*		

	objectives 1, 2, 3, 4, 7, and 7)		

Natural Sciences			
ELO 1 Students understand the basic facts, principles, theories and methods of modern science.	• The position paper for the first and third module will use an analytic rubric with specific line items addressing the accuracy of scientific information presented. (*See paper objectives 1, 2, and 3)* • The short paper will also use a similar rubric.	We will expect students to achieve on average a 70% score on an analytic rubric associated with each paper to be considered to have achieved this outcome.	Data from the Student Assessment of Learning Gains survey will be reviewed, in conjunction with data pulled from the scores on line items of the paper rubric criteria. Based on this data, we will discuss what happened, what went well, and what we want to work on. This will allow for a data-driven plan for future offerings.
ELO 2 Students understand key events in the development of science and recognize that science is an evolving body of knowledge.	• The problem statement of the position papers will require students to address how the scientific issue has come to be a problematic entity worthy of discussion. (*See paper objectives 3 and 4)*		
ELO 3 Students describe the inter-dependence of scientific and technological developments.	• The position paper will require students to address how scientific discoveries will be furthered into technology. (*See paper objectives 1, 2, and 4)*		
ELO 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.	• The position papers will require students to address the possible issues that arise from scientific or technological development. (*See paper objectives 1 and 5)*		

Appendix D: Sample Final Issue Paper Rubric

The rubric below is a general form we will use, which can be slightly modified depending on the specific module topic. Modifications may include additional requirements specific to particular topics. The criteria below represent general outcomes we would expect of any issue paper.

Objective	VALUE	CRITERION	Excellent (100-90%)	Good (90-70%)	Fair (70-50%)	Poor (<50%)	POINTS
1	20 points	**Provide evidence of carefully read research literature**	Paper synthesizes researched material.	Paper demonstrates reasonable understanding of literature, with minor confusions.	Paper demonstrates many misunderstandings about the literature.	Paper demonstrates little evidence of understanding of the literature on which the paper is based.	
2	20 points	**Express scientific ideas effectively and clearly**	Demonstrates clear and effective communication of the ideas.	Demonstrates effective communication, with not more than a couple instances of lack of clarity.	Many instances where communication of ideas is muddled or not effective.	Paper shows little or no effort at effective communication.	
3	20 points	**Demonstrate knowledge of core scientific principles**	Scientific information is accurately represented.	Minor misconceptions presented as scientific fact.	Several instances of misinformation presented.	Demonstrates lack of understanding of scientific principles, showing little research or invalid ideas.	
4	10 points	**Identify the technological developments that have come about as a result of the scientific discovery**	Author identifies several technological developments with adequate explanation of each.	Author provides some list with adequate explanation, but needs additional developments.	Author provides a list with minimal explanation.	Author provides only a list or no explanation of the developments in technology.	
5	10 points	**Demonstrate critical thinking about the implication of the development of technology and its role on society**	Provides strong explanation of the interaction of technology and society. Shows evidence of critical thinking.	Shows some evidence of critical thinking, but a couple ideas are introduced without thorough explanation.	Many ideas are introduced and some are explained, but many are left without evidence of adequate critical thinking.	Shows little evidence of critical thinking.	

6	20 points	**Use appropriate illustrations to support position**	Uses required number of illustrations. All add value to the position. All are well explained.	Uses less than the required number of illustrations. OR Some illustrations chosen do not add substance to the position. OR Illustrations are not fully integrated into the discussion.	Fewer than required number of illustrations and not well integrated into the substance of the paper.	No illustrations provided or illustrations provide no substance to the paper.	
7	20 points	**Use appropriate sources to validate position**	All sources are reliable and validated. Appropriate number of sources used.	Appropriate number of sources used. No more than one citation from a non-validated source.	Missing at least one required source. Multiple citations come from non-validated sources.	More than one fewer than required number of references. Multiple sources are not reliable or validated.	
8	10 points	**Provide proper citation for sources used in the paper**	All sources are cited in proper format including in-text citations.	All sources are properly cited in references, but a small number of instances with missing in-text citations.	All sources are listed in reference section. Some in-text citations, but much of the text lacks citation. Some errors in format of citations.	Missing some sources of information in reference section. Improper formatting used repeatedly. Few or no in-text citations provided.	
9	10 points	**Use logical flow and transitions throughout the paper**	Logical progression of ideas throughout the paper. Strong organization.	Logical order of ideas. A few weak transitions.	Some jumping around of ideas. Weak transitions.	Paper reads as fragmented with little flow or transition. No logic in the flow of the ideas.	
10	10 points	**Clear and effective introduction**	Author provides a reasonable introduction and thesis; sets direction for the paper.	Author provides some justification, but weak thesis statement.	Author provides minimal introduction, and no thesis statement or direction.	Author provides little or no direction or thesis for the paper.	
11	10 points	**Clear and effective conclusion**	Author provides a comprehensive summary of the issue, solution, and justification	Author provides some conclusion but leaves out some aspect of the paper (i.e. no summary,	Author provides minimal summary of the paper or provides new information not contained in the paper.	Author provides little or no summary of the paper.	

				no solution, or no justification)			
12	20 points	**Use proper grammar, spelling, and punctuation**	No errors	No more than 1-2 total errors	3-5 errors	More than 5 errors	
13	20 points	**Integration of review comments**	Author integrates valuable feedback from instructor and peer review.	Author makes some use of feedback, but ignores some valuable feedback	Author makes little use of feedback	Author ignores all use of feedback	

TOTAL out of 200 _____
Scale out of 60 points _____

Appendix E: Sample Syllabus
Biology 2367: Biology and Society
Spring Semester 2017

Lecturer:

Course Coordinator: Adam L. Andrews
Center for Life Sciences Education
255B Jennings Hall
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Program Assistant: Valerie Gilbert
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Class Meeting Schedule:

Lecture: TR, 55 minutes each, Location TBA
Recitation: 80 minutes weekly; Consult your official BuckeyeLink schedule for which section you are to be attending.

Course Materials:

- Required
  - *Writing Science in Plain English*, by Anne Greene. 2013, ISBN: 978-0226026374
  - *The Chicago Manual of Style (16th Edition)*, 2010. ISBN: 978-0226104201
  - Internet Access (Carmen is an integral part of this course. You must activate your OSU email account to have access to Carmen.)
- Recommended: Any recent general biology textbook for reference toward background material.

Prerequisites:

Required: English 1101, and [(*Biology 1113 and 1114)* OR *Biology 1101* OR *Biology 1102*]
Required: Minimum sophomore level standing

Course Philosophy and Structure:

Scientific discoveries, particularly in the field of Biology, are coming so rapidly that it is not surprising that the general public struggles to understand them, much less keep up. Society as a whole is often slow to accept these discoveries. As we must recognize that the general public are the voters who elect policy makers, it behooves us to ensure student have the skills to not only comprehend the ever-changing scientific discoveries of the day, but to communicate effectively a researched position on the topic. The course will be broken into modules, with each module structured similarly. The lecture portion of the course will focus on instruction of applied biological content. The content level of the course will be appropriate for both non-biology and biology majors given the required prerequisite of some core content. The recitation portion of the course will break students into small working groups to collaboratively develop a position on the topic.

GE General Education Goals & Objectives

Students who successfully complete this course will fulfill the following GE goals and objectives:

Level Two Writing and Communication Goals:
Students are skilled in written communication and expression, reading, critical thinking, oral expression and visual expression.

Expected Learning Outcomes:

1. Through critical analysis, discussion, and writing, students demonstrate the ability to read carefully and express ideas effectively.
2. Students apply written, oral, and visual communication skills and conventions of academic discourse to the challenges of a specific discipline.
3. Students access and use information critically and analytically.

Natural (Biological) 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:

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.

Students in Biology 2367 will achieve the natural science objectives through an investigation of applied scientific methods and discoveries, the evolving nature of which have led to technological developments. Students will be introduced to the concepts of a series of case studies involving discoveries in current biological and applied literature, and it will be up to students to work collaboratively with peers to research the topic, recognize the societal implications, and develop issue statements to promote management or restrict the use of those technologies. The iterative writing process will promote student communication skills through regular feedback on writing and oral presentations, while the required collaboration with peers will allow students the opportunity to engage in academic discourse and peer review in these current biological topics.

Biology 2367 Learning Outcomes:
To demonstrate scientific literacy, successful students in the course will be able to:

1. Apply, analyze, and synthesize the basic facts, principles, theories and methods of modern biology.
2. Use quantitative reasoning to evaluate scientific claims and articulate a position on a currently relevant scientific topics using validated scientific information.
3. Find and evaluate sources of reliable scientific information related to primary and secondary literature in relevant biological and aligned disciplines.
4. Work in a group to formulate societal policy options addressing currently relevant scientific topics of opportunity or concern.
5. Demonstrate through critical analysis, discussion, and written work the ability to communicate a scientific idea effectively to peers from a diverse range of disciplines and interests.
6. Effectively deliver an oral presentation demonstrating ability to communicate a complex scientific concept.
7. Improve and build upon one's written work based on feedback provided by instructors and peers.
8. Identify societal impacts of biological advancements.
9. Evaluate the impact of technological developments on society and their consequences.

Grading and Evaluation:
Your mastery of the course material will be based on Issue Papers (a mixture of individual and group work), and recitation activities totaling 700 points.

Issue Papers:
The first and third module will have a set of four papers totaling 225 points per module. These papers will build upon one another, with the final version of the issue paper incorporating each of the previous papers.

Problem Statement: Written individually, this one-page paper will lay out the scientific discovery and why it poses an issue for society. (30 points)

Group Option Statement: Written as a group, students will identify four possible actions to solve issues surrounding the scientific discovery and identify the likely consequences of each in 3-4 pages. (50 points)

Issue Paper: Each student will choose one of the identified options from among those in the group and will expand upon it to a 6-7 page work. Included in this paper will be the problem statement, the option and consequences, and the counterarguments illustrating where the chosen policy is likely to receive criticism. The **first** and **final** drafts of the paper will be each be worth 60 points.

Peer Review: The quality of your peer review feedback to another student on their work will be assessed on the basis of 25 points.

The second module will feature a short writing assignment of 2-3 pages, which will ask students to research a short opinion about the modular topic. The first draft and final draft will each be worth 50 points. The quality of feedback provided in peer review will be assessed out of 25 points.

Oral Presentation: Each student will present his or her ideas on one of the three modules to the recitation section. The class will have the opportunity to question the student on the position. Grades will be assigned out of 45 points based on the quality of the presentation and the ability to effectively communicate the position and justification.

Recitation Activities: 5 written assignments to be completed during or immediately following recitation as indicated in the schedule below. These assignments are designed to direct research and writing skills with regard to the writing assignments. (15 points each = 75 points total)

Student Assessment of Learning Gains (SALG): This survey will be administered during the last week of the course. (5 points)

Final Grades: Your final grade will be based on the percentage of the 700 points that you earn during the course of the semester, as indicated below. Please note that we do not grade the course on a curve and *Carmen* does not round averages up to the next nearest percentage point, so 92.11% and 92.97% both earn the grade of A-.

Grade Scale

93-100%: A	80-82.9%: B-	67-69.9%: D+
90-92.9%: A-	77-79.9%: C+	60-66.9%: D
87-89.9%: B+	73-76.9%: C	≤59.9%: E
83-86.9%: B	70-72.9%: C-	

Posting of Grades: All grades will be posted on Carmen; you will have 10 working days to challenge any grade or inquire regarding any unposted grade; after that time, grades are final. To challenge or inquire about exam grades contact the Program Assistant. All other assignments questions should be addressed to your TA.

Late Assignment Policy: Due dates and times will be adhered to strictly. Late assignments will not be accepted.

Section Changes: All section changes and adds are done by the Course Coordinator. Due to the need to keep up-to-minute availability of seats in each recitation, the lecturer and TAs are unable to sign any permission forms.

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

- Unless otherwise specified for a particular assignment, all submitted work should be a student's own unique effort. Collaborative efforts are not permitted unless expressly sanctioned for a particular assignment.
- Using others' verbatim words without the use of quotation marks *and* citation is plagiarism. Paraphrased work requires citation to denote the use of others' ideas. Copying other's words without quotation while using citations is still considered plagiarism.
- Use of any technology during a quiz or exam (including but not limited to cell phones, smart watches, headphones, electronic dictionaries, etc.) is strictly prohibited.

Diversity and Inclusion: The Center for Life Sciences Education promotes a welcoming and inclusive environment for all students and staff, regardless of race, age, religion, gender, ethnicity, national origin, disability, or sexual orientation. There is no tolerance for hateful speech or actions. All violations of this policy should be reported to the OSU Bias Assessment and Response Team (BART, www.studentaffairs.osu.edu/bias).

Sexual Harassment: OSU and the CLSE consider sexual harassment to be unacceptable behavior that destroys opportunities for learning. While all members of the staff involved in this course have been trained in the OSU sexual harassment policies and procedures, this is not true for all OSU students. Please report any concerns about questionable or unwanted behavior to the lecturer or Mr. Andrews.

Accommodation of Special Needs: Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the course coordinator, Adam Andrews as soon as possible of their needs. Please do this within the first week of the semester. Only the course coordinator is authorized to sign ODS forms. Please fill out those parts of the proctor sheet forms that are to be completed by the student before bringing the form for signature. This will help us ensure that your individual needs will be met appropriately and fairly. 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/.

Issue Resolution: The CLSE believes that student concerns are usually most effectively addressed by the staff closest to the situation. Therefore, students are ordinarily expected to address issues or concerns with their TAs first. If the issue cannot be resolved by your TA, or for some reason you feel that you absolutely cannot address your concern with your TA, please feel free to contact Adam Andrews, or Assistant Director Matt Misicka.

Tentative Lecture and Recitation Schedule (subject to change as events dictate):

Week	Date	Lecture Topic	Recitation	Assignments
1	1-9	Introduction Scientific Literacy	Group Formation and Expectations	Plagiarism Assignment
2	1-16	Scientific Writing	Exploring the Primary Literature vs. Secondary Literature	Research Assignment
3	1-23	Module 1: Genetic Engineering	Recitation Activity 1	M1 Problem Statement Due by 1/29
4	1-30		Write M1 Group Options Statement	Group Options Statement due by 2/5
5	2-6		Oral Presentations	1st Draft M1 Position Paper Due by 2/12
6	2-13		Peer Review of M1 Position Paper	
7	2-20	Module 2: Antibiotic Resistance	Recitation Activity 2	Final M1 Position Paper Due by 2/26
8	2-27		Fall Break – No recitations	
9	3-6		Oral Presentations	Short Paper Draft Due 3/12
SPRING BREAK - March 13-18				
10	3-13	Module 2	Short Paper Peer Review	Short Paper Final Due 3/19
11	3-20	Module 3: Global Climate Change	Recitation Activity 3	M1 Problem Statement Due by 3/26
12	3-27		Write M3 Group Options Statement	Group Options Statement due by 4/2
13	4-3		Oral Presentations	1st Draft M1 Position Paper Due by 4/9
14	4-10		Peer Review of M3 Position Paper	
15	4-17		Recitation Activity	Final M3 Position Paper Due by 4/23
16	4-24		No recitations	SALG Due by 4/24