BROWN

Biotechnology and Global Health BIOL 1070
Spring 2019

Classes will be held on Pfizer campus on Thursdays from 3-6 beginning January 24, 2019

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Office hours: Immediately before or after class, or by appointment

Meeting: Thursday 3-6 pm

Course Description

This course examines the issues pertaining to worldwide problems in human health and the technologies to combat these issues. Global health will be addressed primarily from the scientific and engineering perspectives. Topics include the pathophysiology and epidemiology of major human health issues, highlighting the differences between the developed and developing world. Building from the basic biology, we will analyze how disparities in the burden of disease affect the course of scientific research and how new medical technologies influence public health policies. We will consider how research and engineering approaches are tailored to address different geographical, cultural, and economic challenges, through modern case studies. Medical and research ethics will also be discussed.

Course Goals and Objectives

We will use the knowledge foundation built during undergraduate biology curriculums to explore the epidemiology and pathophysiology of predominant human health conditions. Students will learn disease mechanisms we will evaluate how challenges in both the developed and developing world affect the scientific and engineering approaches to address these global health issues. We will read and analyze contemporary scientific, media, and policy reports to gain an appreciation for the scope and interdisciplinary nature of global health initiatives. Assignments will enhance synthesis and critical thinking skills as well as oral and written presentation ability.

Course Expectations

This course is considered a 1000 level course. As an upper-level course there are certain expectations of proficiency and professionalism. The difficulty of this course, however, will not arise due to the difficulty in the material covered in the course, but rather the breadth of information.

Lecture Topics (subject to change) – SPRING 2019

24-Jan	1. Course introduction 2. Technology Assessment and Health Data
31-Jan	1. The Cost of Health Care 2. Case study: Barrier 3
7-Feb	1. Leading Causes of Mortality 2. Case study: Antibiotic Resistance
14-Feb	Case Study: Immune System and Vaccines
21-Feb	Case Study: Cardiovascular Disease and Biotechnologies
28-Feb	1. Exam 1 2. Group Project Discussion
7-Mar	Case Study: Malaria
14-Mar	1. Obesity gene in the Samoan Population 2. News Article Presentations
21-Mar	1. Case Study: Cancer 2. News Article Presentations
28-Mar	Spring Recess (No Class)
4-Apr	Case Study: Accucirc
11-Apr	Case Study: HIV Drug resistance
18-Apr	1. Exam 2, 2. Group Project Discussion
25-Apr	1. Oral Debates

Grading and Evaluation

10% Attendance and in-class participation from readings
15% News Article Assignment
25% Exam I
10% Semester Project: Written Report
25% Exam II
15% Semester Project: Oral Debate

Grading issues will not be addressed in detail over email. Please make an appointment to discuss any questions.

Due Dates

Any assignment turned in after the due time will automatically loose points, which will continue to be deducted at a rate of 10% per day

Date Due	Assignment
February 21, 2019 by 11:59 pm	Email PDFs of both your news article AND journal article for approval
April 24, 2019 by 11:59 pm	Submit written semester project and slides on Canvas through Turnitin

Course Policies

Students are expected to attend all lecture periods and to have completed all assignments and preparatory work on time. Any assignment turned in after the due date/time will automatically loose points, which will continue to be deducted at a rate of 10% per day. Assignments that are over 10 days overdue receive a zero. Attendance at all lectures and class periods is mandatory. Additionally, a portion of your grade is based on class participation. Suspected violations of the academic code will be reported.
(https://www.brown.edu/academics/college/degree/sites/brown.edu.academics.college.degree/files/uploads/Academic-Code.pdf).

Assignment Overviews (Please see specific assignment information for more details and most up to date information)

Exams

This course will include two closed notes, in class exams. The exams will be based on material covered in class, both on lecture notes and communicated verbally, and on reading assignments (journal articles, news articles, etc.). Students cannot leave the room during the exam period. Missed exams cannot be made up.

News Article Assignment

Please select a recent (2017 - 2018) news article from a reliable mainstream media source that focuses on a global health issue and technology of interest to you and not directly addressed in this course. You will need to do additional research on this topic by locating, reading, and analyzing the scientific source of the article. The scientific source should be a research journal article. You will prepare an oral presentation (elevator pitch) of your topic which you will present in-class. In this presentation you will need to:

1) Summarize the news article to help educate your peers
2) Explain how the article relates to this course
3) Provide a critique and comments on the article based on the knowledge you have gained in this course. Does the news article accurately portray findings?

Semester Project

The culminating project for this course will have two parts: a written report and in-class oral debate.

In the written, double-spaced 5-10 page paper (not including bibliography) you will report on the pros and cons of a particular health policy, technology, or intervention. This paper needs to be written for a technical audience but one that is unfamiliar with the specifics of your topic. Clearly define your topic or issue, provide scientific, case studies, and policy reasons both in support of and against the question at hand. The paper needs to fully and evenly represent both sides. Figures may be incorporated but should be of an appropriate size and should not constitute a significant portion of the page length and should be appended to the end of the document. Be sure to provide appropriate references.

You need to include the following, clearly-delineated sections:

1. Statement of issue or thesis
2. Scientific introduction and background to the topic
3. Supporting evidence in support of this topic
4. Supporting evidence against the topic
5. Summary and Conclusions
6. Your thesis statement and stance for the oral debate

The second portion will be an in-class oral debate in which two students on opposite sides of an issue will use valid, scientific information to convince the class of their position. We will not follow traditional debating structure. Instead, each student group will be allowed to speak for ***15-20 minutes total***. Failure to adhere to these time constraints will be reflected in your grade. First, both students will provide a 2 minute introduction to their topic and position. Then each student will have 10 minutes (with 1 minute leeway) to present the scientific data supporting their stance. You should use PowerPoint (or similar) for this segment, but this should primarily be to display data (Figures, Tables, Maps, etc). Please keep the text on these slides to a minimum. Finally, each student will have 3 minutes to provide a rebuttal and conclude their argument. Then we will

have time allotted for questions from the audience. The student should take care to use the time allotted to them so that they can fully present their case.

Information on Brown's Global Health Initiative can be found here http://med.brown.edu/GHI/. Additionally, to be added to the weekly global health email updates, please contact globalhealth@brown.edu.