Books and Materials.

The “textbook” will be Connect Master: Why Biology 2.0 by Windelspecht. The easiest way to get this is from the Connect course through Canvas. The price online is $90, you would need a credit card or PayPal for this. If you are waiting for scholarship money, you can sign up for complementary access for up to two weeks from the time the first person in the class signs up for it. You can also get an access card from the bookstore (ISBN is: 9781264249206, Author is Windelspecht, Connect Master 2.0 Why Biology?).

Course Description.

The course is “issues based”. What this means is that instead of the traditional model of working through the facts and ideas of biology and then connecting it to examples in real life, we will consider four main themes (plus news) and fit the science into these themes. The themes are listed below.

Master Theme 1: Influenza and COVID-19. Viruses make up the most numerous objects in the biosphere but do not meet all the standards for being alive as does cellular-based life. Further they have direct health consequences for humans. We will consider the characteristics of viruses with special reference to those that cause the human flu and COVID-19. This will include a discussion of how viruses can exploit the central dogma of cellular life to their benefit and their host’s detriment. We will also consider aspects of their life cycles that make treatment with medicines so difficult and ways to get around these. We then will talk about the evolution of viruses, in particular why the flu vaccine is frequently is only partially effective and how the virus that causes COVID-19 was evolved the ability to infect humans. Finally, we will consider how the immune system works and discuss progress towards a possible “universal” flu vaccine and the development of a vaccine that might work against the cause of COVID.

Master Theme 2: Cancer. Almost everyone knows someone who has cancer, who succumbed to it or (thankfully) overcame it. We will discuss cancer and its origins. This will involve a survey of cell structure and function with particular emphasis on the process of cell division. Then we will consider the characteristics of cancer and their medical diagnoses. We will then delve into the causes of cancer with particular emphasis on the genetic mechanisms. Finally, we will talk about the hope for new rational medicine and treatments that potentially could get the root of the disease as opposed to simply treating the symptoms, or even worse, simply making the last days of the cancer patient less miserable.

Master Theme 3: Sickle-Cell Disease and other genetic diseases. Genetic diseases, including sickle cell disease cause untold suffering in real people. We will first conduct an overview of genetic diseases. We will then briefly consider the role of the circulatory system for context. Then we will delve deeply into the central dogma of biology once again in our consideration of DNA and gene expression. After consideration of sexual reproduction and inheritance, we will discuss treatment of genetic disorders including gene therapy. Days before I wrote these words, there is very exciting news on gene therapy for this disease that I hope and expect will provide real long-term relief to patients. (In a sea of bad news for 2020, this is a ray of great news!)
Master Theme 4: Climate change. We will first consider the evidence for human-induced climate change. Then we will talk about the mechanism that has given rise to these changes. The role of carbon and the earth’s carbon cycle will be examined. Then we will move onto the possible consequences of these changes and options for addressing climate change as a society.

Course Management system.

We will be using Canvas for both the lecture and the lab. From the Geneseo main webpage, go to myGeneseo (the shield on the banner), choose canvas then choose this course. From Canvas, you can get access to all needed materials. These include access McGraw Hill Connect, supplemental materials, quizzes etc.

Assignments and due dates:

There will be an average of several assignments per week. These will be accessed and submitted through Canvas.

All major assignments and many minor ones will be given at least a week’s notice (on canvas).

Instructor.

Dr. Harold Hoops, ISC- 353
Telephone: (585) 245-5378
Course specific office hours: M, W, F 11:30-12:20
General office hours: M 9:30-10:30, T 3:00-4:00, R 9:30-10:30 & F 9:30-10:30, or by appointment. (Subject to change after fall 2020 faculty obligations are announced)
E-mail: hoops@geneseo.edu

SI:

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Course Mission Statement & Learning Outcomes.

Contemporary Biology (BIOL 105) is a non-biology major’s course which, when taken together with the laboratory (BIOL 106) fulfills a Natural Science core requirement at Geneseo. BIOL 105 is a lecture course that concerns the application of biology to contemporary personal, social, and environmental problems, especially those resulting from the use of modern technology.

The goal of Contemporary Biology is:

To promote "biological literacy" rigorously and interestingly enough to act as a springboard for future elective studies in biology and to provide a level of skill and understanding that benefit informed citizens as they face life-science related issues (e.g. medicine) in the future.
Specific Learning Outcomes

1. Develop skills of observation of the living world.
2. Know the basic facts and concepts underlying contemporary biological issues especially issues related to genetic engineering, medicine, and global change.
3. Understand and use scientific reasoning to solve biological problems.
4. Acquire learning skills including locating information and critical thinking to become an independent lifelong learner.

How and What Will You Learn?

Many non-majors Biology courses nationwide are simply watered-down versions of introductory biology courses designed for beginning Biology majors. But the main goal of courses designed for Biology majors is in getting students prepared for advanced study in biology. One of my touchstone principles for this course, is that I want to focus on things that will help inform non-majors about aspects of Biology that are relevant to the increasingly science-centric world we live in rather than prepare you for courses you will never take.

As a result, I have striven to reduce vocabulary and isolated factoids as much as possible. Over the five years I have taught this course, I reduced the reading by about 75% and the bolded words by about 85% from that required by the previous instructor. This semester I have changed to an issues-based system where much of the material will be connected to one of four contemporary issues. This has reduced content still further. So, while there is less material to fight through, I expect a higher level of mastery on what is left. College expectations are that you should spend about 9-12 hours a week for a three-credit lecture class inside and outside of the classroom. (Thus 15 credit hours = about 45 hours per week effort = a full-time job.) This includes any time spent reading, doing homework, watching videos etc. Since we will not be required meetings during class time, I suggest that you use that time as part of your allotment. (I can help with this – see later.)

There are multiple studies that indicate that it is more efficient if you spend this much time every week, regardless of the exam schedule, than it is to cram for exams. Also endeavor to study actively – re-reading the text or re-watching videos text multiple times is less effective than reading or watching it fewer time but thinking about what you read. Flash-card studying done well can probably earn you a “C” – to do better you will have to demonstrate the ability to understand the topics thoroughly and to be able to use information to solve novel problems.

I take the title of the course, Contemporary Biology, very seriously. I expect that perhaps 20-30% of the course will be supplementary information, too new to be in any textbook. Obviously, that includes information on the virus that causes COVID-19 (severe acute respiratory syndrome coronavirus 2 or SARS-CoV-2), its epidemiology, mode of action and possible treatments. The portion of your grade based on this supplementary information will be roughly proportional to the time spent on it.

Although I would personally rather teach face to face with lectures interspersed with quizzes and activities in class periods, I have chosen to run this course on-line. There is no classroom available where we could have meet as an entire class and maintained social distancing. The on-line format also allows full engagement for those who are in quarantine or those who may be feeling well enough to engage with the material but are worried about passing the virus on to your classmates. Finally, it
allows an easier transition if changing conditions require individuals or the entire college to transition completely to remote learning. FYI, I have completely reorganized the course, content, course materials, grading scheme, etc. so that my course goals are now congruent with the course delivery plans. (I guarantee that you would not want to sit through three hours of narrated PowerPoints per week.) I estimate about 80% of the material has changed, although the major educational goals have not. Because of the changes in content, it is not worth studying from older course materials.

**Evaluation.**

There will be four grading pools:

1) **Pool B** will be assignments that are directly associated with learning but are formative. You will get full credit by accomplishing these by the deadline. For example, you will frequently take a quiz before delving into the readings on each topic (McGraw Hill Connect calls these units modules, a different use of the word module than is often used at SUNY-Geneseo). You should use the pre-work quizzes to identify gaps in your understanding and to inform you reading and studying. You can do them before or after your reading. You have to do them by the deadline, but completing the pre-work will result in 100% regardless of how many questions you get wrong at this point.

3) **Pool C** will be evaluative, but with resources. For example, there will be a quiz after each module topic in MH Connect. These will have a liberal timing schedule and allow you to look up answers in your notes or the materials, but not necessarily long enough if you have not studied the material before taking them. There will also be similar quizzes based on the supplementary material taken through Canvas, again with open notes.

4) **Pool D** will be exams. These exams will be about 40 questions long, and your will take them from within Canvas. Once started you will have an hour to complete them. They will be available for 12 hours during the exam day and can be taken anywhere within these times. (Note although you can start 1 minute before the exam closes, you would be giving yourself only 1 minute to complete the exam.) Please make sure that you have a reliable internet connection before you start. The questions on these examinations will emphasize critical thinking and using the information – simple word recognition is not enough. You are allowed to use all notes you have made, but you may not have time to search through your notes if you are not very familiar with the material.

There will be 5 such exams. Your lowest score of these exams will dropped. If you are unable to take one of the exams for any reason, that will be the one that gets dropped. If you know that you will miss a scheduled exam for any valid and documented reason, please contact the instructor before the exam – he might allow you to take it *before* the scheduled time. In any cases of verified multiple illness, I will make substitute exams available during the final week. Note that grades in this section are likely to be considerably lower than the other pools. Use the materials in pools a-c to prepare for these exams.
Contribution of each pool to your final grade.

- Pool A: feedback 05% of final grade
- Pool B: formative 20% of final grade
- Pool C: graded quizzes 35% of final grade
- Pool D: exams 40% of final grade

Note that effort alone should guarantee you 100% on a quarter of your grade. It is really important not to miss these points!

Letter grades will be awarded based on the following point distribution:

\[
\begin{align*}
> 93\% & \quad \text{A} \\
90-92.99\% & \quad \text{A-} \\
87-89.99\% & \quad \text{B+} \\
83-86.99\% & \quad \text{B} \\
80-82.99\% & \quad \text{B-} \\
77-79.99\% & \quad \text{C+} \\
73-76.99\% & \quad \text{C} \\
70-72.99\% & \quad \text{C-} \\
60-69.99\% & \quad \text{D} \\
< 60\% & \quad \text{E}
\end{align*}
\]

**Deadlines:** Please meet all deadlines. If the materials are available to you for a week, you don’t get to claim that you deserve an extension because something came up the day it was due. For pools A and B, you might be able to get an extension with a verified excuse. For pool C, you will be penalized 20% a day. It is still worth doing if you are late, but it is better to get it done on time. Note because of technical details, that the late penalty might not be applied for a week or more after completing the activity. I normally do not give extensions on exams, but remember your lowest exam will be dropped.

**Accommodations:** SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will also be made for medical conditions related to pregnancy or parenting. Students should contact the Office of Disability Services (https://www.geneseo.edu/dean_office/disability_services) and their instructors to discuss needed accommodations as early as possible in the semester.

**Religious holidays:** We respect all religious holidays. Contact your instructor if any such conflicts arise before the due date of any assignment or exam.

**Exam dates:**
- Exam 1: Sept 21
- Exam 2: Oct 12
- Exam 3: Nov 2
- Exam 4: Nov 20
- Exam 5: Dec 18
Please note: There are four Master Themes but five exams. Therefore, the exams may cover material from more than one of the Master Themes.

Calendar: The due dates for the exams are listed in the syllabus and in Canvas. Other assignments will be listed only on Canvas.

Class time: M, W, F from 11:30-12:20 is your time. Going to on-line was not to free up my time! Initially at least these office hrs will be online through Zoom. If you have a preference or ideas for other safe options, please let me know.

Student advisory council: I would like to create a four-student advisory council made up of volunteers who are willing to meet with me about bi-weekly and without me at least occasionally. Members of this group can raise any class grading/workload/communication issues with me with a goal of making this a better course. I promise to listen (although I do not promise to agree). There will be no extra credit for this, but students in the past have said that it helps them better understand the goals of their education. If more than four individuals are interested, I will select from 4 members randomly from those applicants. St least one member of the council must consent to publishing their email address so that your classmates know how to reach the council. If you are interested, please send an email to Hoops@geneseo.edu with “volunteer for student council in the subject line” by midnight Friday Sept 4. Individuals from under-represented groups are especially encouraged to apply.

Request for feedback on sensitive issues: We may consider some sensitive issues in this class. As a person of privilege, I will attempt to be sensitive to past or current injustice. If I do say something that you feel is inappropriate or insensitive, please tell me or a member of the student advisory council so that I may address it. Such a comment might be the result of poor phrasing that I can clarify. But if it is the result of my ignorance, then I (and perhaps the class) can learn from it. This is particularly important in an on-line setting because I cannot see anyone’s reactions.

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