Biology 1004: Biotechnology and Society
Fall 2022

Meeting times: 26/9/22-13/10/22	**Instructor title and name:** Dr. Kristopher Koudelka	
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Office Hours: To be determined		**Course Units:** 4
Text: Biology: Science for Life with Physiology		**ISBN:** 0134555430

PLNU Mission

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

DESCRIPTION

An examination of current topics in biotechnology as they impact society, bioethics, and sustainable living. Course addresses the questions "What is biotechnology?", "How does it work?", and "How does it affect our lives?" Topics may include genetic engineering, gene amplification, genome projects, gene therapy, DNA fingerprinting, cloning, and assisted reproductive technology, genetic screening, recombinant DNA, knock-outs, AIDS research, and GM foods. Course approach emphasizes the process of science, critical thinking, active learning, social relevancy, and building connections between case studies and general concepts of biology. Includes studio style lab experiments.

COURSE LEARNING OUTCOMES

1. Students will be able to effectively express ideas and information to others.
2. Students will be able to access and cite information as well as evaluate the logic, validity, and relevance of information from a variety of sources.
3. Students will be able to examine critique and synthesize information in order to arrive at reasoned conclusions.
4. Students will be able to explain the various methods utilized in biotechnology as a means to better understand how science work, as well as how those methods can be applied to better the health of individuals and sustain our environment.

INTEGRATION WITH SCOTLAND

The works of numerous important Scottish scientists will be explored including: Alexander Fleming (penicillin), and Young Simpson (chloroform as an anesthetic). Edinburgh rich history in the anatomical sciences will be investigated through field trips to National Museum of Scotland, the Glasgow Science Centre, and the Surgeons' Hall Museum.

EVALUATION AND GRADING

Your grade for this course will be based on five distinct evaluation tools. Each is described in detail below. A total of 500 points are possible for the entire course.

Exams **(300 points)** - There will be one midterm and a final exam. Each exam will consist of true/false, multiple choice, and short answer questions. All of science is cumulative such that scientific knowledge must build and expand upon

previous knowledge. The same is true when learning science, you must remember and apply all that you have previously learned in order to completely understand and apply newer material. Although the focus of each midterm will be on recent material, each should be thought of as a cumulative exam. The final exam will be semi-cumulative, with about one-third to half of the points coming from the previous chapters and the rest from the most recent chapters.

Exam I: 125 points
Final Exam: 175 points

Group Presentation **(70 points)** - Students will work in small groups (approximately 4 per group) to examine a specialized topic in biotechnology. Each group will present a power point presentation to the class (~15 minutes in length) and lead a discussion on the complexities/issues surrounding that particular topic (worth 60 points: 30 points from me, 20 from your group, and 10 from the class). One week prior to your presentation your group must submit a single outline of what your group will cover (worth 10 points). You can choose your topic and your group. These are available on a first come basis. Topics can include, but are not limited to the following:

Telomeres
Killing cancer cells – chemotherapeutic drugs
Epigenetics
Art Authentication
GM Foods
Biofuels
Cloning Endangered Species/Extinct Species
3D Printing utilizing human cells
Flu Vaccine

Handouts/Worksheets/Lab Responses **(60 points)** – Often times in class we will work in small groups. Various worksheets, case studies, concept maps, labs, etc. will be started in class and usually require some work outside of class to complete.

Trip Responses **(50 points)** – These are one page write ups in response to several questions posed about each field trip and how it relates to the content of the course. The focus of these questions will probe the relationship between science and the public.

Class participation **(20 points) -** I teach largely by a lecture/discussion style. I hope that everyone will participate in the discussion through asking and answering questions. Your general class participation includes discussion, attentiveness, not abusing computer privileges or checking texts. **I am looking for thought and participation, not whether or not you answered the question correctly**.

Late Policy
0-24 hours late = can achieve up to 75% of possible points; 24-48 hours late = can achieve up to 50% of possible points; and more than 48 hours late = will not be accepted.

Approximate grade breakdown

A	93.33-100%	B	83.34-86.66%	C	73.34-76.66%	D	63.34-66.66%
A-	90-93.33%	B-	80-83.33%	C-	70-73.33%	D-	60-63.33%
B+	86.67-89.99%	C+	76.67-79.99%	D+	66.67-69.99%	F	0-59.99%

STUDENT CONDUCT

Attendance of all lectures sessions is required. Role will be taken regularly to encourage compliance. Absences can result in reduction of the final grade; and excessive absences will result in de-enrollment from the course, according to University policy.

Respect for one another and for the instructor is essential for an effective classroom environment. You are expected to show respect to your classmates and instructors by:

- listening when others are speaking,
- refraining from discussing non-related issues during class,
- do not belittle the opinions of others, even when you disagree.

Academic honesty Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. As explained in the university catalog, academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. Violations of university academic honesty include cheating, plagiarism, falsification, aiding the academic dishonesty of others, or malicious misuse of university resources. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for a) that particular assignment or examination, and/or b) the course following the procedure in the university catalog. Students may appeal also using the procedure in the university catalog. See Academic Policies for further information.

PLNU copyright policy Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law. In particular, all homeworks, assignments, exams, and laboratories are owned by Dr. Koudelka and may not be shared with other individuals or groups outside of the students registered for this section. It is a violation of copyright law to otherwise distribute these materials in any form.

Excused absences are those that result from situations beyond the control of the student. These include (but are not limited to) personal illness, serious family illness or death, and sanctioned University events (athletics, debate team, etc.). Excused absences require some formal documentation such as a doctor's note, email from a coach, etc. Work done on a day for which you have an excused absence can be made up in a reasonable amount of time at the instructor's discretion.

Unexcused absences are those that are preventable by the student or are recreational in nature. These include (but are not limited to) oversleeping, forgetting to come to class, attending family functions (weddings, family trips, etc.), and personal leave days. Work performed on days for which you have an unexcused absence cannot be made up and points are forfeited.

ACADEMIC ACCOMMODATIONS

While all students are expected to meet the minimum academic standards for completion of this course as established by the instructor, students with disabilities may request academic accommodations. At Point Loma Nazarene University, students must request that academic accommodations by filing documentation with the Disability Resource Center (DRC), located in the Bond Academic Center. Once the student files documentation, the Disability Resource Center will contact the student's instructors and provide written recommendations for reasonable and appropriate accommodations to meet the individual needs of the student. See Academic Policies in the (undergrad/graduate as appropriate) academic catalog.

FERPA POLICY

In compliance with federal law, neither PLNU student ID nor social security number should be used in publicly posted grades or returned sets of assignments without student written permission. Also in compliance with FERPA, you will be the only person given information about your progress in this class unless you have designated others to receive it in the

"Information Release" section of the student portal. See Policy Statements in the (undergrad/ graduate as appropriate) academic catalog.

STRATEGIES FOR SUCCESS

Cumulative Knowledge. Biology courses usually "build up" so that a concept you learn early on in the course will be used repeatedly during the semester, and will be required to understand subsequent concepts.

I'm here to help you learn. If you get stuck or have any questions on a particular topic or assignment, come to office hours, or make an appointment to see me.

Know your notes. Come to class and take good notes. Borrowed notes never make as much sense. Review, re-write or re-organize your notes while they are still fresh in your mind.

Do not be afraid to ask questions during lecture. Questions are a positive sign of involvement in the course. If you are confused, there are probably other students who feel the same way.

Do not fall behind. Budget a minimum of two hours of studying time between each lecture. Biology and Chemistry are like languages unto themselves - regular practice is essential.

Pay attention to detail. Pay close attention to any scientific terms that we cover in lecture. You will be expected to know and use those terms correctly. I also suggest paying close attention to the details. The "Big Concepts," are important, but the details can be critical.

What's Important? The more time I spend on a particular topic in class, the more likely that same topic will appear on your exams, and at a similar level of detail. If we cover it in class or in the reading, you can consider it fair game for the exam.

Tentative Schedule

	Reading	Subject	Assignment
26/9	p1-16	Process of Science	Worksheet
27/9	p17-24	Stats and Quality Sources	Worksheet
28/9		NMS -Field Trip	Trip Response + Form Presentation Groups
29/9	p418-429	Binge Drinking	Worksheet
3/10		Surgeons Hall Field Trip	Trip Response
4/10		Mid-Term Exam	Group Outline Due
5/10	p455-461	Infectious Agents	
6/10	p462-470	Immune System	Worksheet
10/10		COVID and Scrapie	Worksheet
11/10		Glasgow Science Center - Field Trip	Trip Response
12/10		Presentation Day	Presentations
13/10		Final Exam	