

**Spring (J-term) 2021**

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| <b>Office Hour days:</b> Tuesdays                | <b>Instructor title and name:</b> Prof. Pieter Baker |
| <b>Office Hour times:</b> 11 AM                  | <b>Phone:</b> 760.670.5130                           |
| <b>Meeting location:</b> Prof. Baker's Zoom Room | <b>E-mail:</b> pbaker1@pointloma.edu                 |
| <b>Final Exam:</b> 2/12/2020                     | <b>Additional info:</b>                              |

**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 is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

**COURSE DESCRIPTION**

This course is 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 SARS-Cov-2/COVID-19, genetic engineering, gene amplification, genome projects, gene therapy, DNA fingerprinting, and cloning among others. Course approach emphasizes the process of science, critical thinking, active learning, social relevancy, and building connections between case studies and general concepts of biology.

**COURSE LEARNING OUTCOMES**

Upon completing the course, you should be able to:

1. Articulate and synthesize ideas and information to others through written communication
  2. Access and cite scientific information as well as evaluate the logic, validity, and relevance of information from a variety of sources
  3. Examine and critique scientific information in order to arrive at reasonable conclusions
  4. Solve problems that are quantitative in nature
  5. Describe the function of DNA in the cell and how it is regulated, processed and synthesized
  6. Explain various methods utilized in biotechnology and understand how scientific methods can be applied to improve the health of individuals and sustain our environment
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## COURSE CREDIT HOUR INFORMATION

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In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 4 unit class delivered over 5 weeks. Specific details about how the class meets the credit hour requirement can be provided upon request.

## REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

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Text: *Biology: Science for Life with Physiology along with MasteringBiology Access Card*. Sixth Edition. Colleen Belk and Virginia Borden Maier, Pearson, 2019.

NOTE: This text is available as print or e-text. Be sure to acquire the ACCESS code through the Pearson website. Please do not hesitate to contact the instructor if there is any confusion. Additional detail for how to access the online content will be provided in advance of the course via Canvas.

## STATE AUTHORIZATION FOR ONLINE COURSES

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State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map using the below link to view which states allow online (distance education) outside of California. <https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures>

## ASSESSMENT AND GRADING

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| Assessment                                   | Total Points | % of Final Grade |
|--|--------------|------------------|
| Homework (10 points x 10)                    | 100          | 10%              |
| Life Application Assignments (15 points x 5) | 75           | 7%               |
| Current Events (30 points x 3)               | 90           | 9%               |
| Quizzes (10 points x 10)                     | 100          | 10%              |
| Discussion Activities (20 points x 6)        | 120          | 12%              |
| COVID-19 Peer Teaching Project               | 140          | 14%              |
| Exam 1                                       | 100          | 10%              |
| Exam 2                                       | 125          | 13%              |
| Final Exam                                   | 150          | 15%              |
| Total  | 1000         |                  |

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| Grade Distribution |          |
|--------------------|----------|
| A=93-100           | C=73-76  |
| A-=92-90           | C-=70-72 |
| B+=87-89           | D+=67-69 |
| B=83-86            | D=63-66  |
| B-=80-82           | D-=60-62 |
| C+=77-79           | F=0-59   |

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## INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by 11:59 PM PST (unless noted otherwise) on the date when they are due—including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

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## FINAL EXAMINATION POLICY

Successful completion of this class requires taking the final examination **on its scheduled day (2/12/2020)**. The final examination schedule is posted on the Canvas site. No requests for early examinations or alternative days will be approved.

NOTE: The following policies are to be used without changes:

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## 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.

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## PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. 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. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

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## PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments,

modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. ([DRC@pointloma.edu](mailto:DRC@pointloma.edu) or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

## **PLNU ATTENDANCE AND PARTICIPATION POLICY**

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Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See [Academic Policies](#) in the Undergraduate Academic Catalog.

### **Asynchronous Attendance/Participation Definition**

A day of attendance in asynchronous content is determined as contributing a substantive note, assignment, discussion, or submission by the posted due date. Failure to meet these standards will result in an absence for that day. Instructors will determine how many asynchronous attendance days are required each week.

#### *Note: Fully online courses*

Students taking online courses are expected to attend each week of the course. Attendance is defined as participating in an academic activity within the online classroom which includes posting in a graded activity in the course. (Note: Logging into the course does not qualify as participation and will not be counted as meeting the attendance requirement.)

Students who do not attend at least once in any 3 consecutive days will be issued an attendance warning. Students who do not attend at least once in any 7 consecutive days may be dropped from the course retroactive to the last date of recorded attendance.

Students who anticipate being absent for an entire week of a course should contact the instructor in advance for approval and make arrangements to complete the required coursework and/or alternative assignments assigned at the discretion of the instructor.

## USE OF TECHNOLOGY

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In order to be successful in the online environment, you'll need to meet the minimum technology and system requirements; please refer to the [Technology and System Requirements](#) information. Additionally, students are required to have headphone speakers compatible with their computer available to use. If a student is in need of technological resources please contact [student-tech-request@pointloma.edu](mailto:student-tech-request@pointloma.edu).

Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.

## COURSE SCHEDULE AND ACTIVITIES

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**Readings and Lecture Videos** - Selected readings from the textbook will be supplemented by video lectures and other instructional course materials to be posted on Canvas. All course materials are delivered asynchronously. Students are expected to review reading and lecture materials for that week on the days indicated on the course schedule (typically Mondays and Thursdays). Each week, a detailed overview of selected readings, lectures and all assignments for the week will be posted on Canvas.

**Homework (130 points)** – All homework assignments are due by 11:59 PM PST on the scheduled due date (typically Wednesday, Friday/Sunday). All homework prompts will be posted on Canvas, including links to the Pearson MasteringBiology assignment.

**Life Application Assignments (75 points)** – These weekly assignments involve a brief reading (scripture, poem, etc) and an introspective reflection by the student. They are designed to encourage thoughtful exploration of one's own faith and lived experiences within the context of the course. All life application assignments are conducted on Canvas and due by 11:59 PM PST each week on Tuesday.

**Current Events (90 points)** - These one-page write ups are worth 10 points. You can find any recent article from a reputable newspaper or magazine (NY Times, LA Times, Scientific American, JAMA, STATnews, etc.) which addresses an issue in biotechnology. The questions you should address in your write up are posted on Canvas. These submissions are to be done on Canvas and are due by 11:59 PM PST on the corresponding due dates (1/17, 1/24, 2/3)

**Quizzes (100 points)** - You will have an opportunity to answer a few multiple choice questions related to the course material (n=7). In addition, there are two course surveys: one in the middle of the course and one at the end of the course and an initial state authorization verification survey. The quizzes are open note and are to be conducted on Canvas with a time limitation and completed by 11:59 PM PST on the due date (typically Wednesdays and Saturdays).

**Group Discussion Activities (120 points)** - These small group discussion activities involve group work related to the course material and problem solving to be conducted on Canvas discussion boards. Discussion activities typically involve an original post and engagement/responses to other student posts. The discussion activities will be open on Canvas for at least 48 hours and are due by 11:59 PM PST on the assigned due date (typically Wednesday and Sunday).

**Peer Teaching Assignment (140 points)** - You will examine a specialized topic related to SARS-CoV-2/COVID-19 and will present to four others in your small group teaching them this specialized topic. You will first prepare an outline (15 points) and later a complete set of instructional materials (brief lecture with visual aids) to be presented to your discussion group on Canvas (75 points). Your own learning and their learning will be assessed in a quiz taken at the conclusion of your discussion (20 points). Additionally, your peer teaching presentation will be evaluated by your group members via a peer teaching assessment form (20 points). Thorough instructions can be found on Canvas. All topics deal with SARS-CoV-2/COVID-19. Available topics include: SARS-CoV-2 structure & phylogeny, SARS-CoV-2 natural history, COVID-19 testing assays, mRNA vaccines, and pharmaceutical therapies for COVID-19 (monoclonal antibodies, etc). Brief (<10 min) one-on-one meetings (via zoom) between each student and the instructor will be held between (1/13 – 1/15) to provide instructor support and feedback for students as they develop their peer teaching materials. The peer teaching presentation is due by Sunday, Feb 7 and the peer teaching quiz and assessments are due by Tuesday, Feb 8 by 11:59 PM PST.

**Exams (375 points)** – All exams will be conducted on Canvas, are open note and cumulative. You can expect 100 points to be based upon the new material, and the remainder of the points to be based upon previous material. Exam 1 (1/22) is worth 100 pts, Exam 2 (2/1) is worth 125 pts and the Final Exam (2/12) is worth 150 pts.

**Extra Credit** – Extra Credit assignments will be made available throughout the course. Completion of relevant chapter study modules from the textbook will earn extra credit points toward the exam. Additional extra credit opportunities covering topics in biotechnology related to SARS-CoV-2 and COVID-19 will be made available throughout the course to earn extra credit points towards the final grade. All extra credit opportunities will be completed on Canvas by 11:59 PM PST on the assigned due date (typically Wednesdays and Saturdays)

## SCHEDULE OF COURSE ACTIVITIES AND DUE DATES

| Key (Activity Type) |
|---------------------|
| Read/Watch          |
| Homework            |
| Life Application    |
| Group Discussion    |
| Quiz                |
| Extra Credit        |
| Exam                |
| Office Hours        |

|        | Sunday<br>1/10/2020         | Monday<br>1/11/2020  | Tuesday<br>1/12/2020  | Wednesday<br>1/13/2020   | Thursday<br>1/14/2020                           | Friday<br>1/15/2020  | Saturday<br>1/16/2020   |
|--------|-----------------------------|--|---|--|---|--|---|
| Week 1 |                             | History of Biotech<br>State Authorization Verification<br>Intro to MasteringBiology    | Listen to your life<br>Office Hours<br>Introduce Yourself     | HW - History of Biotech<br>Quiz - History of Biotechnology   | Process of Science                              |  | HW - CH 1<br>Quiz - Process of Science<br>Ch 1 Study Module   |
|        | 1/17/2020                   | 1/18/2020  | 1/19/2020   | 1/20/2020  | 1/21/2020                                       | 1/22/2020  | 1/23/2020   |
| Week 2 | Current Event #1            | Water, Biochemistry, and Cells   | Psalm 61:1,2<br>Office Hours<br>Designing a Concept Map       | HW - Ch 2<br>Quiz - H2O, Biochem & Cells<br>Ch 2 Study Module & Cell Worksheet                               |   | Exam 1   | Quiz - Mid Course Survey<br>Quiz - Select Peer Teaching Topic |
|        | 1/24/2020                   | 1/25/2020  | 1/26/2020   | 1/27/2020  | 1/28/2020                                       | 1/29/2020  | 1/30/2020   |
| Week 3 | Current Event #2            | DNA, Mitosis, Meiosis  | Phantom Tollbooth<br>Office Hours<br>Meiosis/Mitosis Problems | HW - Ch 6<br>Quiz - DNA, Mitosis, Meiosis<br>Ch 6 Study Module   | Mendelian Genetics<br>Peer Teaching Outline Due | Cell Structure Hierarchy<br>Coin Toss Meiosis  | HW - Ch 7<br>Quiz - Mendelian Genetics<br>Ch 7 Study Module   |
|        | 1/31/2020                   | 2/1/2020   | 2/2/2020  | 2/3/2020   | 2/4/2020  | 2/5/2020   | 2/6/2020  |
| Week 4 |                             | Exam 2   | CS Lewis<br>Peer Teaching Revisions                           | Current Event #3<br>Student / Instructor One on Ones (Check-in & feedback/support for Peer Teaching Project) | Complex Patterns of Inheritance                 | VNTR Worksheet<br>Practicing Mendelian Extensions  | HW - CH 8<br>Quiz - CH 8<br>Ch 8 Study Module                 |
|        | 2/7/2020                    | 2/8/2020   | 2/9/2020  | 2/10/2020  | 2/11/2020                                       | 2/12/2020  | 2/13/2020   |
| Week 5 | Peer Teaching Presentations | Genetically Modified Organisms<br>Peer Teaching Assessment<br>Peer Teaching Topic Quiz | Mary Oliver<br>Office Hours                                   | HW - Ch 9<br>Quiz - Ch 9<br>CH 9 Study Module  |   | Final Exam<br>End of Course Evaluation<br>Ted Talks Extra Credit<br>SARS-Cov2 Extra Credit |   |