



Biology Department  
BIO 6033 History & Philosophy  
**3 units**

**Class format, meeting location and time:**

Mostly online with 5 in-person/zoom meetings

Remote meetings or Latter 2, Main Campus, Tuesdays from 5:30-8:00 PM

**Instructor #1**

Dianne L. Anderson, PhD

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Zoom Office Hours: Monday, Tuesday, Wednesday, Thursday from 3:00-4:00PM or by apt.

Join office hours using this link: <https://pointloma.zoom.us/j/95248189087>

**Instructor #2**

Robert Thompson, PhD

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Office, Smee Hall 207

Zoom Office Hours: Monday, Wednesday from 12:00pm-1:00pm or by appointment

Join office hours using this link: <https://pointloma.zoom.us/j/2096515906>

**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 involves discussion of seminal works in the history and philosophy of science to explore both historical ways of thinking and philosophical ways of thinking. From this perspective, the course explores current interest in the nature of science as an integral part of the study of science.  
Predominantly on-line course delivery.

**COURSE LEARNING OUTCOMES**

1. Compare and contrast the differences in scientific thought and processes before and after the scientific revolution.
2. Describe the impact of technological innovations on scientific discovery throughout history.
3. Analyze significant readings in the history and philosophy of science to identify key points.
4. Explain how the nature of science has changed over time, and describe how this is important.
5. Distinguish between science and faith/religion, and discuss the potential compatibility of the two domains. (PLO#4)\*
6. Trace the development of scientific ideas in various subject areas, and in various parts of the world.
7. Distinguish between research in biology and research in history of biology in terms of purpose, methods, and types of evidence.

\*PLO#4 is assessed in this course using the following Signature assignment:

- a. In a 200-300 word essay, distinguish between the types of questions science can answer and the

types of questions faith/religion can answer.

- b. In a 200-300 word essay, discuss the potential compatibility of these two domains within the context of explanations for the diversity of life on earth.

You will have several opportunities during this course to think about and to discuss the relationship between science and faith, as well as how this relationship impacts your everyday life, work, and relationships. Students in the class come from a variety of faith backgrounds and experiences, so we will spend time discussing why and how these issues are important in a respectful and hospitable manner. There is so much that we can learn from each other. Our hope and prayer is that as you explore these ideas, you might closely examine and reflect on your own beliefs and practices.

### Course credit hour information

It is expected that the completion of the reading, participation in discussions (online and in person), and writing required for this course will take approximately 150 hours (or approximately 10 hours per week), therefore, this class meets the PLNU credit hour policy for a 3-unit class.

Weeks	Each week's expectations	Total Hours
Weeks 1-4, 6-7, 8-10, and 12-13	6 hours reading, 2 hours DB or class discussion, 2 hours written assignment	10 hrs. x 11 weeks = 110
Weeks 5 and 11	8 hours preparing presentation, 2 hours in class	10 hrs. x 2 weeks = 20
Final project (week 14)	10 hours written and presentation of final project	10 hours
Final assignment & exam (week 15)	6 hours reading, 2 hours DB or class discussion, 2 hours written assignment	10 hours

### Course readings

The readings for the course will come in three forms: books you purchase, readings available on Canvas, and readings that will be accessed through other websites.

Books to purchase for the course:

- Kuhn, Thomas, *The Structure of Scientific Revolutions*, 1962 (any edition is fine)
- DeWitt, Richard, *Worldviews: An Introduction to the History and Philosophy of Science*, 3<sup>rd</sup> Edition, 2018, John Wiley & Sons. ISBN 978-1119118893
- M.L. Gabriel & S. Fogel (Eds.), *Great Experiments in Biology*. 1955. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. No ISBN, out of print but used copies are available for under \$20. If you can't find one for a reasonable price, I have copies that students can borrow.

### Use of technology

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

### Course Requirements and Grading

*Readings:* You are expected to read the required texts in accordance with the course schedule, as well as every post on the Discussion Board (DB) during the week for which that DB is assigned.

*Homework and discussion board assignments:* Given that we meet together infrequently, this is primarily an online learning community. As such, an ongoing, engaged conversation in the discussion board area is critical to the success of our time together. You will receive up to 10 points each week for DB (or for

participation in in-person discussion if applicable). You are allowed one week of non-participation for illness/family issues, etc. However, every effort must be made to attend the five in-person meetings since there are so few of them.

Each discussion board post to the original DB prompt(s) should be a minimum of 150 words in length and should provide evidence of (1) comprehension of some relevant portion of the reading material and (2) critical engagement with the material. Most weeks, you will not be able to see other students' posts until you respond to the original prompt. Depending on the week, sometimes there will be specific discussion board prompts, and sometimes you will be encouraged to take the reflection into any relevant area that you find interesting.

In addition, you are expected to post responses to at least three other students' reflections on the reading every week. Each response should show comprehension of the reading material, and should engage the other student's reflection in a thoughtful and substantive manner. Discussion may continue past the due date if sufficient interest is ongoing. The minimum requirement is three responses per week.

*Summative assessments for the course:* Pairs of students will prepare and present two 10-minute presentations that trace the development of scientific thought on two different topics. The first presentation will be on a topic relevant to the History of Medicine, and the second will be on the historical development of thought in one area of biology or chemistry. Details about these presentations are available within the appropriate module. Each presentation is worth 50 points.

Near the end of the course, students will be expected to complete a final project that encompasses and draws on much of the material in the course. There are four options for the final; these choices are described in the Final Project module. Students are expected to provide a citation page with full bibliographic information for their sources as well as appropriate in-text citations within the body of the paper. Essays without appropriate grammar, structure, formatting, and citation, will receive a lowered grade. This assignment serves as the final exam for the course.

*Grading:*

Written assignments	10 points/week x 12 weeks = 120 points
Discussion Board posts/Class discussions	10 points/week x 12 weeks = 120 points
Presentations	50 points each x 2 = 100 points
Final project/exam	50 points
<b>Total for course</b>	<b>390 points</b>

Letter grades will be assigned as follows: A- (90-91), A (92-100)  
B- (80-81), B (82-87), B+ (88-89)  
C- (70-71), C (72-77), C+ (78-79)  
D- (60-61), D (62-67), D+ (68-69)  
F Below 60

*Note: There is often an assumption that something is wrong when a student receives less than a perfect score for an assignment. A perfect score is quite unusual, especially on large assignments, and means that there were no errors, and no suggestions for improvement could even be made. This is rarely the case.*

*Incompletes and Late Assignments*

Assignments submitted within 24-hours of the due date will earn up to half credit. Assignments submitted later than 24 hours may not earn credit. With respect to final project and the presentations, we will deal with extreme circumstances beyond the control of the student(s) on a case by case basis. In

such cases, and depending on the circumstances, there may be a significant reduction in grade. Incomplete grades will only be assigned under extremely unusual circumstances.

### **Inclusive language policy**

The use of inclusive language is now prevalent, even expected, throughout most sectors of our society (e.g., academia, government, business, religious organizations). Further, inclusive language is very often a more accurate and fair representation of the intended meaning of a person's communicative content. As such, everyone is expected to make use of inclusive language in all written work. The avoidance of such use in a given project will result in a lowering of the grade for that project. In addition, everyone is expected to make use of inclusive language during classroom discussions.

### **Discrimination/harassment policy**

Discrimination or harassment related to race, gender, ethnicity, sexual identity or orientation, differences in ability, religious choice, or any other type of behavior that dehumanizes human beings or dismisses difference, is not conducive to a good learning environment and is harmful to human vitality and healthy community. These behaviors will not be tolerated. We encourage all students to be open to any honest, respectful, and tactful discussion of issues that might arise in the context of our learning.

## **GENERAL PLNU POLICIES**

### **PLNU SPIRITUAL CARE**

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#### **Mission Valley:**

PLNU strives to be a place where you grow as a whole person. To this end we provide resources for our Graduate and Adult Degree Completion students to encounter God and grow in their Christian faith. At the Mission Valley (MV) campus we have an onsite chaplain, Rev. Gordon Wong, who is available during class break times across the week. If you have questions for, desire to meet or share a prayer request with Rev. Wong you can contact him directly at [mvchaplain@pointloma.edu](mailto:mvchaplain@pointloma.edu) or [gordonwong@pointloma.edu](mailto:gordonwong@pointloma.edu). Rev. Wong's cell number is 808-429-1129 if you need a more immediate response.

In addition, on the MV campus there is a prayer chapel on the third floor which is open for use as a space set apart for quiet reflection and prayer.

### **PLNU COPYRIGHT POLICY**

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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.

### **PLNU ACADEMIC HONESTY POLICY**

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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 the [Academic Honesty Policy](#) in the Graduate and Professional Studies Catalog for definitions of kinds of academic dishonesty and for further policy information.

### **PLNU ACADEMIC ACCOMMODATIONS POLICY**

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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, 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 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 **synchronous** class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions (virtual or face-to-face), the faculty member will issue a written warning of 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. In some courses, a portion of the credit hour content will be delivered **asynchronously** and attendance will be determined by submitting the assignments by the posted due dates. See [Academic Policies](#) in the Graduate and Professional Studies Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

### **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.

Hybrid courses:

At Point Loma Nazarene University, attendance is required at all scheduled classes. Adult Degree Completion courses are taught in the hybrid format, which means some class meetings will be face-to-face and some will be online. Attendance in the face-to-face classes is to be for the entire time of the class. Arriving late or leaving early will be considered a partial absence. A day of attendance in an online class is determined as contributing a substantive note, assignment, discussion, or submission that adds value to the course as determined by the instructor. Three days of attendance are required each week.

#### Face-to-face Portion of the Hybrid course

In blended or hybrid courses, if a student misses one face-to-face class then the faculty member will send an email to the student and the Director of Student Success warning of attendance jeopardy. There are no exceptions to this policy.

If a student misses two face-to-face classes, the faculty member or Vice Provost for Academic Administration (VPA) will initiate the student's de-enrollment from the course without further advanced notice to the student. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of "F" and there will be no refund of tuition for that course.

#### Online Portion of the Hybrid Course

If a student misses two online classes (fails to contribute to a discussion board) during the course, then the faculty member will send an email to the student and the Director of Student Success warning of attendance jeopardy. There are no exceptions to this policy.

If a student misses three online classes (fails to contribute to a discussion board by the due date) during the course, then the faculty member or Vice Provost for Academic Administration (VPA) will initiate the student's de-enrollment from the course without further advanced notice to the student. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of "F" and there will be no refund of tuition for that course.

1 missed F2F class = warning

2 missed F2F classes = de-enrollment

2 missed online classes = warning

3 missed online classes = de-enrollment

Students taking hybrid/blended courses lasting over 14 weeks are expected to attend each week of the course. Attendance is defined as logging into the course each calendar week to check on updates and announcements. In addition, students must participate in the academic graded activities during the calendar week the assignments/activities are due. Students must also attend all scheduled face-to-face meetings. Students who do not attend at least once in any given calendar week will be issued an attendance warning. Students who do not attend at least once in any two consecutive weeks in the online will 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 Fall 2020

All details regarding readings and assignments can be found in the Canvas modules for each week.

Since the in-person meetings are all on Tuesdays and will be spent discussing the readings/assignments completed in the previous week, this will be our typical weekly schedule:

1. Wednesdays are the start of the week – begin new assignments
2. First DB (if assigned) posts will be due by midnight on Saturdays
3. Written assignments and second DB posts (if assigned) will normally be due by midnight on Mondays
4. In-person discussions will be held Tuesdays (5 times during the semester)

Weeks with no in-person meeting will have discussion board assignments twice during the week

Week	Date of in-person/zoom meetings (Tuesdays 5:30-8:00PM)	Topics
1 - Sept. 1		Introduction to course, Philosophy of Science, and scientific contributions from around the world
2 - Sept. 8	Zoom session	<b>Philosophy of Science: Aristotle to Kepler</b> <b>The difference between faith/religion and science</b> <b>Panel discussion: theologian, philosopher, historian, scientist</b> <b>Role of “regular people” - artisans, sailors, craftspeople, etc.</b>
3 - Sept. 15		Philosophy of Science: Galileo to Newton
4 - Sept. 22		History of Medicine
5 - Sept. 29	Zoom session	<b>History of Medicine presentations</b> <b>Class Discussion</b>
6 - Oct. 6		The very large and the very small
7 - Oct. 13		History of Biology: Photosynthesis
8 - Oct. 20	Zoom Session	<b>History of Biology: Genetics and Evolution</b> <b>Examination of OLD books</b>
9 - Oct. 27		History of Biology: Darwin
10 - Nov. 3		History of Biology: Molecular Biology
11 - Nov. 10	Zoom session	<b>History of Biology presentations</b> <b>Class Discussion</b>
12 - Nov. 17		Philosophy of Science: Popper and Kuhn
Thanksgiving week		Small reading assignment only
13 - Dec. 1		Philosophy of Science: The Structure of Scientific Revolutions
14 - Dec. 8	Zoom session	<b>Discussion of Final project</b>
15 - Dec. 15		Final exam History of Biology research

