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**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.

**COURSE DESCRIPTION**

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This exam is required for students in the graduate program in general biology to complete their graduation requirements if the thesis option is not chosen. Credit/No Credit, 0 unit

**COURSE LEARNING OUTCOMES and PROGRAM LEARNING OUTCOMES ASSESSED IN THIS COURSE**

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The Course Learning Outcomes are the first three PLO's for the program. These PLO's will be assessed by four professors using the rubric at the end of this document upon submission of the exam answers:

1. Discuss major concepts and theories in biology.
2. Carry out and communicate various experimental methods and types of data analysis.
3. Demonstrate knowledge and skills in critical thinking, such as analysis and synthesis, as applied to primary literature in the field of biology, as well as in science education and the history/philosophy of science.

**GRADING**

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Credit/No credit is assigned based on the satisfactory completion as described above; no letter grades are given.

**EXAM FORMAT AND GRADING**

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A student completing the MS non-thesis option in general biology will be required to write the MS exam following the completion of all course work and on a schedule agreed on by the student and Dr. Anderson. The exam will consist of three parts:

- Part I: Analysis of research articles related to summer courses
- Part II: Main ideas of four summer courses
- Part III: Main ideas of the History & Philosophy of Science course and the Science Education course

You will choose **three summer courses** to focus on in the exam including at least one organismal course and one cell/molecular course (see categories below). Dr. Anderson will contact the appropriate professors to obtain one research article appropriate to each of the selected courses.

Organismal courses	Cell/molecular courses
Physiology of Plants & Animals Marine Biology Evolutionary Biology Ecology of Plants & Animals	Developmental Biology Microbiology & Immunology Genetics & Molecular Biology Cell Biology

Let Dr. Anderson know the following information:

1. Three summer courses on the exam
2. Start date of the exam (you may have up to 72 hours/3 days)
3. Start time of the exam (8AM, 12PM, 4PM or 8PM)

Both before and during the exam, you may consult course materials, textbooks, and internet sources (including to look up terms, etc.). You may only consult the program director, not other faculty members, students, or the authors of the research articles to clarify exam questions, article content, or exam instructions. You will e-mail the completed exam to Dr. Anderson.

The completed exam will be assessed for clarity, accuracy, thoroughness, and use of appropriate vocabulary by the professors who taught the courses (see detailed rubric at the end of this document). Each professor will review the exam answers related to the course that they taught to determine if the student earns the credit for that particular section. You will be notified by Dr. Anderson if either a) all sections passed or b) at least one section did not pass and will need to be resubmitted. Depending on the time of year, you can expect feedback in approximately 2 weeks. If the exam is submitted during PLNU holiday breaks, this time will be extended. If your work location has deadlines for submission of your posted degree, check with Dr. Anderson to find out when you can expect your degree to be posted depending on your exam date.

If any sections do not pass, you will schedule a 48-hour period to rewrite the section(s) to address the deficiencies, and to resubmit that portion of the exam. If that resubmission does not pass, you will receive one additional chance to rewrite before the degree will be denied. Note: Due to faculty vacations in July/August, if the exam is completed between July 15-August 15, feedback may not be received in time for any revisions to be made in order to meet the August degree-posting date. This could result in the degree being posted in October.

## GENERAL PLNU POLICIES

### 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 Academic Policies 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. ([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 are 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 Graduate and Professional Studies Catalog for additional detail.

**PLNU MS in General Biology Comprehensive Exam Rubric, Part I: Research article analysis**

Row	Paper #	Aspect of answer	Initial (fail)	Emerging (fail)	Developed (pass)	Highly Developed (pass)
1	#1a	General relevance to field	Missing	Unclear	Clear, but not accurate or unclear, incomplete or lacks depth of analysis	Clear and accurate
2	#1a	General problem/question	Missing	Unclear	Clear, but not accurate or incomplete	Clear and accurate
3	#1a	1 <sup>st</sup> major claim	Identified claim is inaccurate or not important	Identified claim is inaccurate or incomplete or lacks depth	Accurately identified claim, but not a main claim	Accurately identified the one of most important claims
4	#1a	Evidence	Specific data is not identified or does not match the claim; no evidence	Relevant tables, figures, etc. are mentioned but no specific areas; 1 piece of evidence	Specific areas of relevant figures, tables, etc. are correctly identified; 2 pieces of evidence	Specific areas of relevant figures, tables, etc. are correctly identified; 2+ pieces of evidence
5	#1a	Justification	Justification missing for claim	Weak attempt made to justify claim, but inaccurate, incomplete, or unclear	Justification given for why data supports the claim, but not clear or incomplete	Clear justification as to why the data supports the claim
6	#1a	Methods	Methods missing AND not in own words	Missing some major methods OR not in own words	Major methods identified in own words, but unclear	Relevance of major methods clearly explained
7	#1b	2 <sup>nd</sup> major claim	Identified claim is inaccurate or not important	Identified claim is inaccurate or incomplete or lacks depth	Accurately identified claim, but not a main claim	Accurately identified the one of most important claims
8	#1b	Evidence	Specific data is not identified or does not match the claim	Relevant tables, figures, etc. are mentioned but no specific areas	Specific areas of relevant figures, tables, etc. are correctly identified	Specific areas of relevant figures, tables, etc. are correctly identified
9	#1b	Justification	Justification missing for claim	Weak attempt made to justify claim, but inaccurate, incomplete, or unclear	Justification given for why data supports the claim, but not clear or incomplete	Clear justification as to why the data supports the claim
10	#1b	Methods	Methods missing	Missing some major methods OR not in own words	Major methods identified in own words, but unclear	Major methods clearly identified in own words
11	#2a	General relevance to field	Missing	Unclear	Clear, but not accurate or unclear, incomplete or lacks depth of analysis	Clear and accurate
12	#2a	General problem/question	Missing	Unclear	Clear, but not accurate or incomplete	Clear and accurate
13	#2a	1 <sup>st</sup> major claim	Identified claim is inaccurate or not important	Identified claim is inaccurate or incomplete or lacks depth	Accurately identified claim, but not a main claim	Accurately identified the one of most important claims
14	#2a	Evidence	Specific data is not identified or does not match the claim	Relevant tables, figures, etc. are mentioned but no specific areas	Specific areas of relevant figures, tables, etc. are correctly identified	Specific areas of relevant figures, tables, etc. are correctly identified
15	#2a	Justification	Justification missing for claim	Weak attempt made to justify claim, but inaccurate, incomplete, or unclear	Justification given for why data supports the claim, but not clear or incomplete	Clear justification as to why the data supports the claim
16	#2a	Methods	Methods missing	Missing some major methods OR not in own words	Major methods identified in own words, but unclear	Major methods clearly identified in own words
17	#2b	2 <sup>nd</sup> major claim	Identified claim is inaccurate or not important	Identified claim is inaccurate or incomplete or lacks depth	Accurately identified claim, but not a main claim	Accurately identified the one of most important claims
18	#2b	Evidence	Specific data is not identified or does not match the claim	Relevant tables, figures, etc. are mentioned but no specific areas	Specific areas of relevant figures, tables, etc. are correctly identified	Specific areas of relevant figures, tables, etc. are correctly identified

19	#2b	Justification	Justification missing for claim	Weak attempt made to justify claim, but inaccurate, incomplete, or unclear	Justification given for why data supports the claim, but not clear or incomplete	Clear justification as to why the data supports the claim
20	#2b	Methods	Methods missing AND not in own words	Missing some major methods OR not in own words	Major methods identified in own words, but unclear	Major methods clearly identified in own words
21	#3a	General relevance to field	Missing	Unclear	Clear, but not accurate or unclear, incomplete or lacks depth of analysis	Clear and accurate
22	#3a	General problem/question	Missing	Unclear	Clear, but not accurate or incomplete	Clear and accurate
23	#3a	1 <sup>st</sup> major claim	Identified claim is inaccurate or not important	Identified claim is inaccurate or incomplete or lacks depth	Accurately identified claim, but not a main claim	Accurately identified the one of most important claims
24	#3a	Evidence	Specific data is not identified or does not match the claim	Relevant tables, figures, etc. are mentioned but no specific areas	Specific areas of relevant figures, tables, etc. are correctly identified	Specific areas of relevant figures, tables, etc. are correctly identified
25	#3a	Justification	Justification missing for claim	Weak attempt made to justify claim, but inaccurate, incomplete, or unclear	Justification given for why data supports the claim, but not clear or incomplete	Clear justification as to why the data supports the claim
26	#3a	Methods	Methods missing AND not in own words	Missing some major methods OR not in own words	Major methods identified in own words, but unclear	Major methods clearly identified in own words
27	#3b	2 <sup>nd</sup> major claim	Identified claim is inaccurate or not important	Identified claim is inaccurate or incomplete or lacks depth	Accurately identified claim, but not a main claim	Accurately identified the one of most important claims
28	#3b	Evidence	Specific data is not identified or does not match the claim	Relevant tables, figures, etc. are mentioned but no specific areas	Specific areas of relevant figures, tables, etc. are correctly identified	Specific areas of relevant figures, tables, etc. are correctly identified
29	#3b	Justification	Justification missing for claim	Weak attempt made to justify claim, but inaccurate, incomplete, or unclear	Justification given for why data supports the claim, but not clear or incomplete	Clear justification as to why the data supports the claim
30	#3b	Methods	Methods missing AND not in own words	Missing some major methods OR not in own words	Major methods identified in own words, but unclear	Major methods clearly identified in own words

**PLNU MS in General Biology Comprehensive Exam Rubric: Description of summer course major concepts**

Row	Summer course	Aspect of answer	Initial (fail)	Emerging (fail)	Developed (pass)	Highly Developed (pass)
31	#1	Choice of topic	Topic not addressed in course	Topic of minor importance in course	One of several main topics from course	Clearly a central topic from course
32	#1	Topic description	Inaccurately described	Accurately described, with minimal/no use of course vocabulary, or somewhat inaccurate	Accurately described, with some use of vocabulary from the course	Accurately described using appropriate vocabulary from the course
33	#2	Choice of topic	Topic not addressed in course	Topic of minor importance in course	One of several main topics from course	Clearly a central topic from course
34	#2	Topic description	Inaccurately described	Accurately described, with minimal/no use of course vocabulary, or somewhat inaccurate	Accurately described, with some use of vocabulary from the course	Accurately described using appropriate vocabulary from the course
35	#3	Choice of topic	Topic not addressed in course	Topic of minor importance in course	One of several main topics from course	Clearly a central topic from course
36	#3	Topic description	Inaccurately described	Accurately described, with minimal/no use of	Accurately described, with some use of	Accurately described using appropriate

				course vocabulary, or somewhat inaccurate	vocabulary from the course	vocabulary from the course
37	#4	Choice of topic	Topic not addressed in course	Topic of minor importance in course	One of several main topics from course	Clearly a central topic from course
38	#4	Topic description	Inaccurately described	Accurately described, with minimal/no use of course vocabulary, or somewhat inaccurate	Accurately described, with some use of vocabulary from the course	Accurately described using appropriate vocabulary from the course

**PLNU MS in General Biology Comprehensive Exam Rubric: Question about major course concepts**

Row	Course	Initial (fail)	Emerging (fail)	Developed (pass)	Highly Developed (pass)
39	History & Philosophy of Science	Answer incomplete AND inaccurate	Answer incomplete OR inaccurate	Answer accurate and complete, using some appropriate vocabulary from the course	Answer accurate, complete, and well written using appropriate vocabulary from the course
40	Science Education Seminar	Answer incomplete AND inaccurate	Answer incomplete OR inaccurate	Answer accurate and complete, using some appropriate vocabulary from the course	Answer accurate, complete, and well written using appropriate vocabulary from the course