Mathematical, Information and Computer Sciences
Shared Syllabus for Problem Solving

Section, Instructor Information		Office Hours
1	Kyle Havens Rohr Science 278 (619-849-2219) KyleHavens@pointloma.edu	**WF** 4:00 pm – 5:30 pm
2	Kyle Havens Rohr Science 278 (619-849-2219) KyleHavens@pointloma.edu	**WF** 4:00 pm – 5:30 pm
3	Jesús Jiménez Trailer #1/RS234 (619-849-2634) JesusJimenez@pointloma.edu	**MW** 1:00 pm – 4:00 pm **R** 1:00 pm – 3:00 pm
4	Jesús Jiménez Trailer #1/RS 234 (619-849-2634) JesusJimenez@pointloma.edu	**MW** 1:00 pm – 4:00 pm **R** 1:00 pm – 3:00 pm

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Section, Meeting Days, Time, and Room			
1	Monday Wednesday	1:00 pm – 2:15 pm 1:00 pm – 2:15 pm	LBRT 201
2	Monday Friday	1:00 pm – 2:15 pm 1:00 pm – 2:15 pm	LBRT 201
3	Tuesday Thursday	9:45 am – 10:15 am 9:00 am – 10:15 am	LBRT 202
4	Tuesday Thursday	10:30 am – 11:00 am 10:30 am – 11:45 am	LBRT 202

Online Text
Excursions in Mathematics, 9th Edition

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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.

Department Mission
The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

Course Description
A general education course whose major goal is to develop the ability to solve non-routine problems through dynamic processes of inquiry and exploration, logical reasoning, making and testing conjectures and investigating implications of conclusions. A study of quantitative reasoning with emphasis on active problem solving and developing connections with other disciplines. Not applicable toward a major in Mathematics.
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Course Learning Outcomes
GE Learning Outcome: Students will be able to solve problems that are quantitative in nature:
- Students will be able to formulate a mathematical model from a verbal description of a problem.
- Students will be able to solve non-routine problems using logic and quantitative techniques.
- Students will be able to construct solutions to problems using computational techniques

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General Education Statement
PLNU provides a foundational course of study in the liberal arts informed by the life, death, and resurrection of Jesus Christ. In keeping with the Wesleyan tradition, the curriculum equips students with a broad range of knowledge and skills within and across disciplines to enrich major study, lifelong learning, and vocational service as Christ-like participants in the world's diverse societies and cultures.

This course is one of the components of the General Education Program at Point Loma Nazarene University, in support of the general education learning outcome: *Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature*. The purpose of general education is to provide a common educational experience, to develop essential skills, and to provide a broad cultural background for personal and professional growth.
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Required Material
Calculator: A scientific calculator is required. During examinations, you may not use your cell phone as a calculator.
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Course Credit Hours Information
In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 3-unit class delivered over 15 weeks. Specific details about how the class meets the credit hour is provided below.

Online Quizzes	8.00
Online Homework	8.75
Reading Text	24.00
Watching Videos	8.00
n-Class Meeting	18.75
Written Homework	16.00
Group Project	6.00
Budget Project	4.00
Chapter Post Test Reviews	16.00
Midterms	2.50
Final Exam	2 .50
TOTAL	114.50

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Course Philosophy
The general method of the course is to involve students in "dynamic processes of inquiry and exploration, logical reasoning, making and testing conjectures, and investigating implications of conclusions" [Catalog]. Specifically, the focus is on the processes and tools of quantitative problem solving. Learning what they are and developing ability to use them.

"Today's world is more mathematical than yesterday's, and tomorrow's world will be more mathematical than today's." "...mathematics...serves as a key to opportunity and careers."[Everybody Counts, p.45, p.3]

"To participate rationally in a world where discussions about everything from finance to the environment, from personal health to politics, are increasingly informed by mathematics, one must understand mathematical methods and concepts, their assumptions and implications." [50 Hours, p.35]

In view of these statements and many other similar ones from national reports, this quantitative experience (MTH 303) has been included as part of the PLNU general education curriculum. Thus, all students will study "major concepts, methods, and applications of quantitative reasoning with emphases on active problem solving" [Catalog].
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Course Approach
The ability to solve problems requires resourcefulness, flexibility, and efficiency in dealing with new obstacles. Research on teaching and learning problem solving suggests that certain factors are critical to successful problem solving, including resources, heuristics, control, and belief systems [Schoenfeld, 1985].

1. Resources refer to whatever information problem solvers understand (or misunderstand) that might be brought to bear on a problem.
2. Heuristic refers to strategies and techniques problem solvers have (or lack) for making progress when working on non-routine problems.
3. Control refers to the way problem solvers use (or fail to use) the information at their disposal.
4. Belief systems refer to the problem solver's "world view" of the problem domain, which determines the ways they use the knowledge in the first three categories.

The approach in MTH 303 develops and uses these factors to increase your problem-solving ability. Classroom techniques used include:

- the teacher as role model
- whole-class problem solving with teacher as control
- small-group problem solving with teacher as coach

In addition, you are assigned readings and problems that will help you identify and make progress in the four areas discussed above.
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Course Methods
Use of groups: There is almost a century of research showing that academic achievement, productivity, and self-esteem improve dramatically when students work together in groups. This method emphasizes teamwork, cooperation and support by others, rather than isolation and competition in learning.

Role of the classroom instructor: There will be less direct "lecturing" in class than usual, with many questions "answered" by another question to help you work through your own questions and difficulties. You are expected to learn problem solving through active involvement - reading, writing, and explaining to others what you are thinking and doing.

This may require some adjustment in the way you think about teaching and learning. Initially, you may wish for more direct information and answers, but your patience and effort will be rewarded with a deeper understanding and increasing independence in problem solving, as well as confidence in your ability to tackle new problems.

Grading Distribution

Grade Distribution	
Two Tests at 20% each	40%
Final Exam	30%
Quizzes	5%
Written and/or Online Homework	12%
Group Project	5%
Individual Budget Assignment	5%
Class Participation	3%
Total	100%

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Grading Scale
A passing grade requires getting at least 60% in one of the two tests or on the final exam. Grades are based on the number of points accumulated throughout the course. Approximate minimal percentages required to obtain a given grade are:

Grading Scale in Percentages				
	A	B	C	D
+		(87.5, 90]	(77.5, 80]	(67.5, 70]
	(92.5, 100]	(82.5, 87.5]	(72.5, 77.5]	(62.5, 67.5]
−	(90, 92.5]	(80, 82.5]	(70, 72.5]	[60, 62.5]

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Grade components
The grade components are written homework, written tests, online homework, online quizzes, projects, class participation, and the final examination.
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Other factors that affect grades
Late work: All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Late work need not be accepted. Work accepted late may be assessed a penalty. Make-up tests will be given only by prior arrangement with the instructor for reasons of documented emergency.

Incomplete grade: Incompletes will only be assigned in extremely unusual circumstances. You may request a grade of I (incomplete) only if you are having a passing grade an at least 70% of the course work is completed.

Questions on written assignments, tests, and exams: Written assignments and test/exam questions and problems must be formulated carefully in terms of words and symbols used in the course. Credit is determined by the degree to which answers and solutions respond to the specific question or problem stated. Maximize your credit by learning the language and symbols of the course.

Written Assignments: Assignments collected must be prepared in a style suitable for grading. The following guidelines are used to determine credit:
- the organization must be easy to follow
- the work must be legible
- complete solutions must be written for problems (not just answers);
- answers must be clearly marked use complete sentences to answer questions

Tests and Final Examination: Tests and the final exam will include problems and questions over material assigned in the text, readings and handouts, as well as material presented in class. No examination shall be missed without prior consent or a well-documented emergency beyond your control. A score of zero will be assigned for an examination that is missed without prior consent or a well-documented emergency beyond your control.

The examination schedule is included in the daily schedule. This instructor does not intend to accept excuses such as poor communication with parents, benefactors, surf team sponsors and/or travel agents. The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor.

Only in the case that a student is required to take three exams during the same day of finals week is an instructor authorized to change the exam date and time for that particular student. The student must contact each professor in order to work out an alternate time for one of those examinations. Department chairs/school deans and college deans need not be involved in the process of making this accommodation. Such accommodations and the negotiations necessary to arrange them must be completed at least four weeks prior to the official time of the final examination.
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Attendance
Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day.

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 http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class_Attendance in the Undergraduate Academic Catalog.
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NOTE: For Blended courses, attendance will be calculated as follows:

Face to face portion of the class:
You must be present on time for the full class for you to be considered present in the face to face meeting.

Online portion of the class:
You are expected to work on material online every week. In order to get credit for being "present" in the online portion of the class each week you must complete at least one online homework assignment or exam review assignment (for test weeks) before the due date/time for that week.

You will receive a warning if you miss 10% of the class (combination of face-to-face and online).

You will be automatically de-enrolled if you miss 20% of the class (combination of face-to-face and online).
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Class Enrollment
It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of **F** on the official transcript.
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Academic Accommodations
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 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.

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Academic Honesty
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 http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty for definitions of kinds of academic dishonesty and for further policy information.
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Copyright Protected Materials:
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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THE FINAL EXAM IS A COMPREHENSIVE EXAMINATION.
Successful completion of this class requires taking the final examination on its scheduled day.
The final exam date, time and place is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.
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Homework
These assignments are to be written up on paper and handed in at the beginning of class on (or before) the due date.

Chapter	Page	Problems
1	28-35	# 16, 30, 38, 48, 54
2	59-66	# 20,32,54, 62, 64
4	128-135	# 22, 32, 40, 56, 64
5	164-172	# 26, 30, 46, 54, 64
6	195-204	# 36, 42, 52, 54, 60
7	221-226	# 30, 34, 36, 42, 50
8	250-258	# 46, 52, 56, 60, 62
10	317-320	# 46, 50, 54, 58, 62

Comments on homework:

1. This is the minimum amount of homework that is required but you may need to do several odd numbered problems to make sure you get the answer in the textbook.
2. A homework assignment is late if it is not received at the start of class on the due date. No late homework will be accepted except by prior arrangement or with a documented emergency.
3. Please be sure that your homework is stapled together and the problems are in order.
4. Homework will be scored on a combination of completeness and correctness. All work necessary to complete a problem must be shown to earn credit.
5. Start working on your homework early. These problems are difficult and meant to be done a little at a time over the course of a few days.
6. When doing homework, please note it is normal to not be able to do every problem correct on the first attempt. Do not be discouraged, instead seek help.

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SCHEDULE

Week	Day	Date	Lab	Activities
1	Tue	1/8/2019		Send email with instructions for MyMathLab (Pearson)
1	Wed	1/9/2019		
1	Thu	1/10/2019		Class: Introduction, 1.1-1.3
1	Fri	1/11/2019		Due: Introduction O.A. Read: 1.1-1.3, Video: Paradoxes of Democracy
2	Tue	1/15/2019	Lab	
2	Wed	1/16/2019		Read: 1.4-1.6, Video: Examples 1.9, 1.10, 1.13, 1.17
2	Thu	1/17/2019		Class: 1.4-1.6
2	Fri	1/18/2019		Due: Quiz 1, OA 1
3	Tue	1/22/2019	Lab	Read: 2.1-2.3
3	Wed	1/23/2019		Read: 2.4, Video: Examples 2.5, 2.7, 2.9, 2.10, 2.11, 2.12, 2.17
3	Thu	1/24/2019		Class: 2.1-2.4, Set up: 2.4, Due: HW 1
3	Fri	1/25/2019		Due: Quiz 2, OA 2
4	Tue	1/29/2019	Lab	
4	Wed	1/30/2019		Read: 4.1-4.4, Video: Examples 4.1, 4.3, 4.4, 4.5
4	Thu	1/31/2019		Class: 4.1-4.4
4	Fri	2/1/2019		
5	Tue	2/5/2019	Lab	
5	Wed	2/6/2019		Read: 4.5-4.6, Video: Examples 4.6, 4.8, 4.9
5	Thu	2/7/2019		Class: 4.5-4.6, Due: HW 2
5	Fri	2/8/2019		Due: Quiz 4, OA 4
6	Tue	2/12/2019	Lab	
6	Wed	2/13/2019		Read: 5.1-5.4, Video: Euler paths & circuits, Examples
6	Thu	2/14/2019		Class 5.1-5.4, Due: HW 4
6	Fri	2/15/2019		
7	Tue	2/19/2019		Review: Exam 1
7	Wed	2/20/2019		
7	Thu	2/21/2019		**Exam 1**
7	Fri	2/22/2019		Due: Quiz 5, OA 5
8	Tue	2/26/2019	Lab	Read: 6.1-6.2, Video: 5.16, 5.18, 5.20, Read: 6.1-6.2, Video: 6.1, 6.5, 6.8
8	Wed	2/27/2019		Read: 6.3-6.5, Video: Examples 6.9, 6.12
8	Thu	2/28/2019		Class: 6.1-6.5, Set up: 7.1-7.2, Due: HW 5
8	Fri	3/1/2019		
9	Tue	3/5/2019		**Spring Break**
9	Wed	3/6/2019		**Spring Break**
9	Thu	3/7/2019		**Spring Break**
9	Fri	3/8/2019		**Spring Break**
10	Tue	3/12/2019	Lab	
10	Wed	3/13/2019		Read: 7.1-7.3, Video: Examples 7.4, 7.7, Nearest Neighbor, Cheapest Link, 7.9, Outback Cable Co.
10	Thu	3/14/2019		Class: 7.1-7.3, Set up 8.1-8.2, Due: HW 6
10	Fri	3/15/2019		Due: Group Project, Quiz 6, OA 6
11	Tue	3/19/2019	Lab	
11	Wed	3/20/2019		Read: 8.1-8.4, Video: 8.2, 8.9
11	Thu	3/21/2019		Class: 8.2-8.4, Set up: 8.5, Due: HW 7
11	Fri	3/22/2019		Due: Quiz 7, OA 7

12	Tue	3/26/2019	Lab	
12	Wed	3/27/2019		Read: 8.5, Video: Examples 8.11, 8.12
12	Thu	3/28/2019		Class: 8.5, 10.1-10.2
12	Fri	3/29/2019		
13	Tue	4/2/2019	Lab	Review: Exam 2
13	Wed	4/3/2019		
13	Thu	4/4/2019		**Exam 2**
13	Fri	4/5/2019		
14	Tue	4/9/2019	Lab	Read: 10.1-10.2, Video: 10.2, 10.5, Percentages
14	Wed	4/10/2019		
14	Thu	4/11/2019		Class 10.1, 10.2, Due: HW 8
14	Fri	4/12/2019		Due: Quiz 8, OA 8
15	Tue	4/16/2019	Lab	Read: 10.3, 10.4, Video: 10.9, 10.13, 10.17
15	Wed	4/17/2019		
15	Thu	4/18/2019		**Easter Break**
15	Fri	4/19/2019		**Easter Break**
16	Tue	4/23/2019	Lab	
16	Wed	4/24/2019		Read:10.4, Video: Interest compounding monthly, Interest compounding daily, College trust fund
16	Thu	4/25/2019		Class: 10.3, 10.4 Note: HW 10 is due on the Final Exam date.
16	Fri	4/26/2019		Due: Budget Project, Quiz 10, OA 10
17	Tue	4/30/2019		
17	Wed	5/1/2019		
17	Thu	5/2/2019		
17	Fri	5/3/2019		**Final Exam 1:30 pm - 4:00 pm (All sections), Due: HW 10**

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