Shared Syllabus for Problem Solving

Instructor by Section	**Text**	**Table of Contents**
1) Jesús Jiménez RS 218 (849-2634) 2) Jesús Jiménez RS 218 (849-2634) 3) Catherine Crockett RS 226 (849-2723) 4) Catherine Crockett RS 226 (849-2723) 5) Lynda Wynn RS 210 (849-2715)	*For All Practical Purposes:* *Mathematical Literacy in Today's world* 8th Edition COMAP, Inc. New York: W.H. Freeman & Co. ISBN: 1-4292-0900-3	
Classes Meets in RS 236 1) MWF 1:30-2:20 PM 2) MWF 3:00-3:50 PM 3) TR 8:00-9:15 AM 4) TR 1:30- 2:45 PM 5) TR 4:00-5:15 PM		

Required Materials

Calculator: A scientific calculator is required.

Course Content

This is a general education course designed to give students experience with problem solving using a variety of techniques and examples of "real world" problems. The course content is taught in three major blocks they are:

- Planning: including various types of scheduling
- Fairness: including apportionment and voting
- Financial literacy: including saving, borrowing, budgeting and the use of credit cards

General Education Statement

This course is one of the components of the General Education Program at Point Loma Nazarene University, under the category of *Developing Cognitive Abilities*. By including this course in a common educational experience for undergraduates, the faculty supports the pursuit of personal awareness and skill development, focusing on the analytical, communicative, and quantitative skills necessary for successful living in society.

General Education Learning Outcomes for this Course

A. Students will demonstrate effective written and oral communication skills, both as individuals and in groups.
    1. Students will be able to formulate a mathematical model from a verbal description of a problem.

B. Students will use quantitative analysis, qualitative analysis, and logic skills to address questions and solve problems.
    2. Students will be able it solve non-routine problems using logic and quantitative techniques.
    3. Students will be able to construct solutions to problems using computational techniques.

Course Aims

The overall aim of this course is "to develop the ability to solve nonroutine problems through dynamic processes" [Catalog]. More specific goals are:

- To involve the student directly in various problem solving activities.
- To contribute to the student's ability to solve nonroutine problems.
- To expand the student's methods of inquiry and exploration.
- To contribute to the student's ability to form conjectures and check implications.
- To expand the student's understanding of major concepts, methods and applications of quantitative reasoning.
- To help the student to see the importance of problem solving in modern society.

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.

Course Philosophy

"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]

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].

- Resources refer to whatever information problem solvers understand (or misunderstand) that might be brought to bear on a problem.
- Heuristic refers to strategies and techniques problem solvers have (or lack) for making progress when working on nonroutine problems.
- Control refers to the way problem solvers use (or fail to use) the information at their disposal.
- 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.

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 Policy

Grade Distribution	
Three Tests at 15% each	45%
Final Exam	25%
Homework	12%
Group Project	8%
Individual Budget Assignment	5%
Class Participation	5%
Total	100%

Grading Scale

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]

Grade components: The grade components are tests, written assignments, projects, essays, and the final examination. Other factors that affect grades are

- Late work: A written assignment or computer assignment is late if it is not received at the beginning of class on the due date. Late work need not be accepted. Work accepted late may be assessed a penalty. Make-up tests (or the exam) will be given only by arrangement with the instructor for reasons of documented emergency.
- 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.

Attendance Policy

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 in which a student is registered is considered essential to optimum academic achievement. Therefore, regular attendance and participation in each course are minimal requirements to be met. There are no allowed or excused absences except when absences are necessitated by certain university-sponsored activities and are approved in writing by the Provost. Whenever the number of accumulated absences in a class, for any cause, exceeds ten percent of the total number of class meetings, the faculty member has the option of filing a written report to the Vice Provost for Academic Administration which may result in de-enrollment, pending any resolution of the excessive absences between the faculty member and 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 W or WF (no grade). There are no refunds for courses where a de-enrollment was processed." (see catalog for full text)

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.

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 require academic accommodations. At Point Loma Nazarene University, students requesting academic accommodations must file 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. This policy assists the university in its commitment to full compliance with Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities (ADA) Act of 1990, and ADA Amendments Act of 2008, all of which prohibit discrimination against students with disabilities and guarantees all qualified students equal access to and benefits of PLNU programs and activities.

Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

Academic Honesty

The Point Loma Nazarene University community holds the highest standards of honesty and integrity in all aspects of university life. Academic honesty and integrity are strong values among faculty and students alike. Any violation of the university's commitment is a serious affront to the very nature of Point Loma's mission and purpose.

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. Such acts include plagiarism, copying of class assignments, and copying or

other fraudulent behavior on examinations. For more details on PLNU's policy go to:
http://www.pointloma.edu/experience/academics/catalogs/undergraduate-catalog/point-loma-education/academic-policies

A student who is caught cheating on any item of work will receive a zero on that item and may receive an "F" for the semester. See the PLNU Catalog for a further explanation of the PLNU procedures for academic dishonesty.

Classroom Attire

All students are expected to dress in ways that allow the classroom to be a place where all students are comfortable and can work efficiently. Certain distracting attire is not permitted in the classroom. For example, attire associated with the "rush" activities of fraternities and sororities simply causes too many distractions in the classroom. If you choose to "rush" one of the fraternities or sororities, please make sure the "rush" officials know that "rush" attire will not be allowed in this classroom.

Final Exam: Date and Time

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 FINAL EXAM IS A COMPREHENSIVE EXAMINATION.

Section 1 Final	Monday, April 30	1:00 pm - 3:00 pm
Section 2 Final	Friday, May 4	1:00 pm - 3:00 pm
Section 3 Final	Thursday, May 3	8:00 am - 10:00 am
Section 4 Final	Tuesday, May 1	1:00 pm - 3:00 pm
Section 5 Final	Tuesday, May 1	3:30 pm - 5:30 pm

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