

# Math 223 Fundamentals of Elementary Mathematics

## Spring 2017 -- Blended (3 units)

Thursday 2:30-3:45 Req., Tuesday 2:30-3:45: Opt. LBRT 202

**Instructor:** Ryan Botts, Ph.D.  
**Office Hours:** M 8:30-9:30 & 1-4, WF 8:30-9:30  
TTh 9-10 & 1-2

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**Text:** *Mathematics for Elementary Teachers: A Problem Solving Approach (11th edition)* By Billstein, Libeskind and Lott (Access via canvas, you may use the code from the previous semester)

**Needed Supplies:** Access to a computer, calculator, compass, protractor and ruler.

### Course Description

A continuation of Mathematics 213 focusing on additional knowledge necessary for a California multiple-subject teaching credential (K-8). Topics covered in this course include data analysis and statistics, probability, combinations and permutations, simulations as well as standard and non-standard measurement. Planar and three dimensional geometry and geometric constructions are studied, including an algebraic approach to geometry. This class is highly interactive and emphasizes group work and cooperative learning.

### Philosophy and Approach:

Research in learning theory shows that students who learn mathematics effectively must be actively involved in the process, not just passive listeners/observers. In particular, in order to really learn and understand mathematical ideas and processes you must become deeply involved in activities such as exploring, discussing, analyzing, explaining, conjecturing, defending, negotiating, testing, and evaluating. To do this you need good problems to solve, interaction with others on solutions, and opportunities to write your conclusions.

The mathematical experience of the students in MTH213 and MTH223 varies widely. This means that different students will need to spend different amounts of time to learn the material. To help assist in this process, the class is designed as a blended class. You will be doing pre-tests, reading and some homework problems (you get two attempts at each problem) online this will allow you spend the amount of time that you need to learn the basics before we engage in activities in class.

### Objectives:

The course is designed to help you:

- acquire knowledge and develop understanding of the conceptual and procedural foundations for teaching elementary school mathematics
- develop the ability to teach mathematics developmentally (i.e., basing procedural knowledge on clear connections with prior conceptual knowledge)
- acquire knowledge and develop ability to create a problem solving environment in the classroom, to set and achieve teaching goals, to stimulate and manage classroom discourse, to use technology effectively, and to make ongoing instructional decisions
- acquire confidence sufficient to teach elementary mathematics positively and enthusiastically

**Learning Outcomes**

- Students will be able to demonstrate a facility with operations on the integers.
- Students will be able to demonstrate a facility with operations on the rational numbers.
- Students will be able to apply concepts from number theory to solve problems.

**Grading:**

Your grade for the course is based on:

Online Homework	15%
Written Homework	20%
Review Exercises for Exams	5%
1 in-Class Written Exam	25%
Cumulative Final Exam	35%
Total	100%

The grading scale for the course is:

	A	B	C	D
+		(87,90)	(77,80)	(67,70)
	[92,100]	[82,87]	[72,77]	[62,67]
-	[90,92)	[80,82)	[70,72)	[60,62)

**Note that a student who fails both the In-Class Exam and the Final Exam will not pass the class regardless of the total points accumulated.**

**Graphical Schedule of Assignments**

A graphical representation of assignments can be seen in the schedule below.

**Credit Hour Information: Distribution of Student Learning Hours**

It is anticipated that you will spend a minimum of 37.5 participation hours per credit hour in your course. The estimated time expectations for this course are shown below:

Reading: Text and Notes	29
Online Homework	21
In-Class Meeting + Written Exam	18.75
Written Homework	27
Exam Preparation (online reviews)	15
Final Exam	2.5
TOTAL	113.25

**Homework:**

You will have two types of homework:

Online Homework - this will be due at 11:59 PM the Wednesday before our class face to face meeting. Your online homework will be graded by the computer. You will have two attempts to work each problem.

Written Homework - this will be **due at the start of class** the next Thursday. No late homework will be accepted except by prior arrangement or with a documented emergency. In your written homework I expect to see calculations using the terminology and methods of the class and not just the answer. A random selection (the same for all people) of the problems will be graded on any homework assignment.

**Exams:**

There is one in-class exam. If you do not take an exam you will receive a zero for it. Late exams may be taken only by prior arrangement or with a documented emergency. I must participate in the decision for you to miss an exam, this means that you need to phone me before missing an exam.

**Final:**

The final is cumulative and is given on **THURSDAY MAY 4, 1:30-4:00 PM**. 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.

**University Mission:**

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.

**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 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 as approved in writing by the Provost for specific students participating in certain university-sanctioned activities. Excused absences still count toward the 10%-20% limits, but allow students to make up work, quizzes, or tests missed as a result of a university-sanctioned activity. Activities of a unique nature, such as labs or other activities identified clearly on the syllabus, cannot be made up except in rare instances when instructors have given advanced, written approval for doing so. Whenever the number of accumulated absences in a class, for any cause, exceeds ten (10) percent of the total number of class meetings, the

faculty member should send an e-mail to the student and the Vice Provost for Academic Administration (VPAA) warning of attendance jeopardy. If more than twenty (20) percent of the total number of class meetings is reported as missed, the faculty member or VPAA may 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 W or WF consistent with university policy in the Grading section of the catalog. There are no refunds for courses where a de-enrollment was processed. For more details see the PLNU catalog: [http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Class\\_Attendance](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Class_Attendance)

Because this course is a hybrid course, **here is how attendance will be calculated:**

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.

If you miss 10% of the class, you will receive a warning. If you miss 20% of the class, you will be automatically de-enrolled.

#### **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 their courses as established by the instructors, students with special needs 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. Students can also reach the Disability Resource Center by phone at 619-849-2486 or by e-mail at [DRC@pointloma.edu](mailto:DRC@pointloma.edu). Once the student files documentation, the Disability Resource Center contacts the student's instructors and provides 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 special needs and guarantees all qualified students equal access to the benefits of PLNU programs and activities. For more details see the PLNU catalog: [http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic\\_Accommodations](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Accommodations)

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. Any violation of the university's commitment is a serious affront to the very nature of Point Loma's mission and purpose. Violations of academic honesty include cheating, plagiarism, falsification, aiding academic dishonesty, and malicious interference. The details of PLNU's meaning of each of these words can be found in the PLNU catalog

at: [http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic\\_Honesty](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Honesty)

A student remains responsible for the academic honesty of work submitted in PLNU courses and the consequences of academic dishonesty beyond receipt of the final grade in the class and beyond the awarding of the diploma. Ignorance of these catalog policies will not be considered a valid excuse or defense. Students may not withdraw from a course as a response to a consequence.

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

([http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic\\_Honesty](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Honesty)).

**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.

**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.

**Credit Hour:** In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 3.0 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

**E-mail and Messages:**

I expect that you regularly use e-mail. I will periodically send you information and updates via e-mail and/or via canvas. In the first week of class you must activate your PLNU e-mail account if you are not currently using it. Please try to send questions about specific problems or course details to me via Canvas so that all members of the class can see the response.

**Some Tips About This Class:**

- Reading mathematics is a fairly slow process and will require you to read things more than once. Do not get behind, you want to be working on class material most days.
- Read with a pencil in hand. Be sure to fill in details and check the author's computations. It will probably help your studying if you write these calculations in a notebook.
- Read the material and work the online problems with the text before attempting quizzes and written homework.
- Work lots of problems. Part of becoming good at mathematics is practice.
- Work in groups. You learn a lot if you have to explain your solution to someone else (we will be doing this in class).

- Stay current with your assignments (cramming won't help)

	S	M	T	W	T	F	S
	8	9	10	11	12 Intro	13	14
	15	16 Martin Luther King Jr. Day	17 Open Lab	18 9.1-9.3 Online	19 9.1-9.3 Activities	20	21
	22	23	24 Open Lab	25 9.4-9.5 Online	26 9.4-9.5 Activities HW 2 Due	27	28
	29	30	31 Open Lab	1 10.1-10.3 Online	2 10.1-10.3 Activities HW 3 Due	3	4
February	5	6	7 Open Lab	8 10.4-10.5 Online	9 10.4-10.5 Activities HW 4 Due	10	11
	12	13	14 Open Lab	15 11.1-11.2 Online	16 11.1-11.2 Activities HW 5 Due	17	18
	19	20	21 Open Lab	22 11.3-11.4 Online	23 11.3-11.4 Activities HW 6 Due	24	25
	26	27	28 Open Lab	1 Exam Review Problems	2 Exam HW 7 Due	3	4
March	5	6 Spring	7 -----	8 Break	9 -----	10 Week	11
	12	13	14 Open Lab	15 12.1-12.2 Online	16 12.1-12.2 Activities	17	18
	19	20	21 Open Lab	22 12.3-12.4 Online	23 12.3-12.4 Activities HW 9 Due	24	25
	26	27	28 Open Lab	29 13.1-13.2 Online	30 13.1-13.2 Activities HW 10 Due Project Due on Canvas	31	1
April	2	3	4 Open Lab	5 13.3-13.4 Online	6 13.3-13.4 Activities HW 11 Due	7	8
	9	10	11 Open Lab	12	13 Easter Recess	14	15
	16	17 Easter Recess	18 Open Lab	19 14.1-14.3 Online	20 14.1-14.3 Activities HW 12 Due	21	22
	23	24	25 Open Lab	26 14.4-14.5 Online	27 14.1-14.5 Activities Final Review HW 14 Due	28	29
	30	1	2	3	4 Final 1:30-4:00 HW 15 Due	5	6

Week	Due Date	Textbook Problems
1		None
2	1/26/2017	9.1: 2,5,6,9,10 9.2: 2,5,6,11,14 9.3: 1,4,7,8
3	2/2/2017	9.4: 2,3,6,7,10,11,14 9.5: 2,3,6,7,10,12
4	2/9/2017	10.1: 1,4,5,7,11 10.2: 2,4,5,14,15 10.3: 1,4,6,9,11
5	2/16/2017	10.4: 1,2,5,7,9,15,16 10.5: 2,5,6,14,15
6	2/23/2017	11.1: 2,6,9,11,14,15 11.2: 3,8,9,16,19,20
7	3/2/2017	11.3: 1,2,8,9,11,12(a,b,c,d) 11.4: 2,4,5,6,9,12
8		None
9	3/23/2017	12.1: 2,7,8,10,12 12.2: 3,4,5,8,9,19(a,b)
10	3/30/2017	12.3: 2,3,4,12,13(a,b),14 12.4: 3,4,5(a,b),7,10,11 (Project also due)
11	4/6/2017	13.1: 1,3,5,7,8,15 13.2: 1,3,7,8,11
12	4/20/2017	13.3: 1,3,4,6(a,b),7,9 13.4: 1,2,3,4,7,8
13		Work on Project
14	4/27/2017	14.1: 2,5,6,11,16 14.2: 2(a,b,c,d),6,8,9,12 14.3: 2,6,8(b,d),9,10
15	5/4/2017	14.4: 1,2,7,12,15 14.5: 3,4,5,11,13,15