

## MTH424-1 Fall 2013: Real Analysis

**Email** rbotts@pointloma.edu

**Office Hours:** MWF 2:40-4:30, TTh 1:30-2:45

**Instructor** Dr. Ryan Botts

**Office** RS 228

**Phone** 619-849-2968

**Course mascot:** Llama

**Class Time** MFW 1:30 pm – 2:35 pm

**Location** RLC

**Textbook:** Analysis with an Introduction to Proofs. Lay, Steven.

**Corequisites:** MTH 223,242 and Junior Standing

### Course Description:

Real Numbers, topology of Euclidean  $n$ -space, continuity, differentiation and integration theory.

### Course Learning Outcomes:

1. Students will be able to demonstrate facility with analytical concepts.
2. Students will be able to write and understand proofs.
3. Students will be able to communicate effectively orally and in writing.

### Course Philosophy:

Mathematics is primarily learned by **doing** mathematics- not simply listening to it; that is the effective learning of mathematics is an active process, involving participation. Thus, in order to maximize student achievement, the course aims to maximize your involvement.

Individual concepts in mathematics are **learned** (not just memorized) by thinking and working through numerous examples and exercises involving these concepts.

The instructor is responsible for the overall planning, for directing instructional activities and for evaluation of student achievement.

**You** are responsible for your own achievement. Thus it is your responsibility for meeting all scheduled activities, assignments and exams; you are also responsible for regular work outside of class.

### Proofs:

Learn by doing! You have had a brief introduction to proof writing in MTH242. In this course, you will reinforce these skills while learning new concepts. You will be most successful if you participate in the in-class proof writing activities, stay current with the homework and re-write proofs that have been returned to you containing errors.

### Grade components:

One midterm (25%), proof of the week (20%), Homework(20%), Final (35%)

### Grading Standards:

- *Late Work:* A written assignment is considered late if it is not received at the beginning of class on the due date. Late work need not be accepted or may be assessed a penalty. Homework will typically be collected two class meetings after it is assigned. Make-up tests will only be given for documented emergencies.
- *Accuracy:* Solutions on written assignments and examination questions must be formulated carefully in terms of words and symbols. Credit is determined based on the degree to which a solutions responds to the specific stated problem.

- *Formatting:* Collected assignments must be written in a format that is suitable for grading. The work must be legible, organization must be clear and the complete solution (not just answers) must be submitted.

**Please note:** The Final Exam is **COMPREHENSIVE**.  
December 20 , (Friday ) at 1:30 p.m. to 4:00 p.m.

- **Grading Scale:** Course grades will be assigned according to the following scale:

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)

#### **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 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 an F. 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.

**Cell Phones:** Turn off any cell phone while you are in class. Also, do not text or work on other classes while in class -to do so is disrespectful to me and your classmates. You may be asked to leave the class for such behavior, resulting in an absence.

	S	M	T	W	T	F	S
Sep 2013	1	2 Labor Day	3	4 Sec 1 and 2 Logical Con. And Quant's	5	6 Sec 3 T.O.P.	7
	8	9 Sec 4 T.O.P. cont.	10	11 Sec 5 Set Operations	12	13 Sec 6 Relations	14
	15	16 Review c	17	18 Sec 7 Funcitons	19	20 Sec 8 Cardinality	21
	22	23 Sec 8 Cardinality	24	25 Sec 10 Induction	26	27 Proof Writing Wkshp	28
	29	30 Sec 11 Ordered Fields	1	2 Sec 12 The Completeness Axiom	3	4 Sec 12 Continued	5
Oct 2013	6	7 Sec 13 Topology	8	9 Sec 13 Continued	10	11 Sec 14 Compact Sets	12
	13	14 Sec 14 Continued	15	16 Sec 16 Convergence	17	18 Sec 17 Limit Theorems	19
	20	21 Proof Writing Wkshp	22	23 Exam 1	24	25 Fall Break	26
	27	28 Sec 18 Sequences	29	30 Sec 20 Limits	31	1 Sec 21 Continuous Fun.	2
Nov 2013	3	4 Sec 22 Prop of Cont. Fun	5	6 Sec 23 Unif. Continuity	7	8 Sec 25 Derivative ( <i>Drop Deadline</i> )	9
	10	11 Sec 26 MVT	12	13 Sec 27 L'Hospital's Rule	14	15 Sec 28 Taylor's Thm	16
	17	18 Sec 29 The Riemann Int	19	20 Sec 30 Prop of the Riem. Int.	21	22 Sec 31 FTC	23
	24	25 Sec 32 Convergence	26	27 Thanksgiving Break	28	29 --	30
Dec 2013	1	2 Sec 33 Conv. Tests	3	4 Sec 34 Power Series	5	6 Sec 35 Point. And Unif Converg.	7
	8	9 Sec 36 Apps of Unif. Conv.	10	11 Sec 37 Unif. Conv. Of Pwr Series	12	13 Review	14
	15	16	17	18	19	20 Final 1:30-4	21