MICS/School of STEM

MTH 4091- Independent Study in Mathematics

2.0 Units

Fall 2026

Meeting days/times: Tuesdays, 2:15pm-4:00pm

Meeting location: LBST201

Final Exam: TBD

Instructor Title and Name: Dr. Catherine Crockett
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Email: catherinecrockett@pointloma.edu

Office Location and Office Hours: Office hours are held in my office, which is in **RS 222.** The hours listed below are when you can drop- in, no appointment necessary.

Monday: 11:00 to 12:00
Wednesday: 11:00 to 12:00
Friday: 10:30 to 12:00 and 1:00 to 2:30
Tuesday: 1:00 to 2:30
Thursday: 1:00 to 2:30
Or you can make an appointment by emailing me.

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 is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department Mission

MICS: 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

Study of a selected problem or topic under the direction of an instructor. The instructor and student propose the course of study. Approval by the department chair is required.

Research Topic: Real Analysis II; a continuation of Real Analysis I.

Prerequisite(s): Approval of the department chair and consent of instructor.

Program and Course Learning Outcomes

1. Students will be able to demonstrate facility with analytical concepts.
2. Students will be able to write proofs.
3. Students will be able to speak about their work with precision, clarity and organization.
4. Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats.

Required Texts and Recommended Study Resources

Textbook: Analysis with an introduction to proof. Sixth Edition.

Author: Steven R. Lay

Publisher: PEARSON. ISBN 978-0-321-74747-1

Students are responsible for having the required course textbooks prior to the first day of class.

All supplemental materials posted on this course site (including articles, book excerpts, or other documents) are provided for your personal academic use. These materials may be protected by copyright law and should not be duplicated or distributed without permission of the copyright owner.

ASSESMENT AND GRADING

The grade components are written homework, quizzes, midterm exams, and the final examination.

Homework: Homework will be assigned every class meeting. All homework assigned in a week will be due at the beginning of Wednesday's class of the following week. No late homework will be accepted except by prior (meaning more than 24 hours before) arrangement (with me) or with a documented emergency.

Comments on homework:

- 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.
- Please be sure that your homework is stapled together, and the problems are in order.
- **Homework will be scored on a combination of completeness and correctness. All work necessary to complete a problem must be shown to earn credit.**
- 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.
- 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.
- The two lowest homework scores will be dropped before calculating the overall grade for homework.

Examinations and the Final Examination: There is one midterm and one final exam. The exams will include problems and questions over material assigned in the text, readings, and handouts, as well as material presented in class. If you do not take an exam, you will receive a zero for it. Late exams may be taken only by prior arrangement with me or a well-documented emergency beyond your control. The examination schedule is included in the daily schedule. Please note I do not intend to accept excuses such as poor communication with parents, benefactors, sport team sponsors and/or travel agents.

GRADING SCALE

A passing grade requires getting at least 60% on the mid term 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:

Late work will not be accepted. Homework assignments that are submitted late will be recorded with a score of zero. During the course, you may find that you are unable to submit homework on time due to a personal situation (for example, a personal or family illness, accident, business trip, etc.). This is why your lowest assignments will be dropped, as described above. There are no exceptions to this policy so please use your dropped assignments wisely.

Grades will be based on the following:

Type of assignment:	**Percentage of the course grade:**
Mid Term	30%
Final Exam	45%
Written Homework	25%
	Total = 100%

Grading Scale

Grades are based on the number of points accumulated throughout the course with the following exception. A student must pass at least one of the three exams or the Final Examination in order to pass the class. That is, a score of 60% must be achieved on one of the Examinations, or else the final grade will be an F regardless of all other point totals. Approximate minimal percentages required to obtain a given grade are:

Standard Grade Scale Based on Percentages

A	B	C	D	F
A [92.5-100]	B+ [87.5-90)	C+ [77.5-80)	D+ [67.5-70)	F [0-60)
A- [90-92.5)	B [82.5-87.5)	C [72.5-77.5)	D [62.5-67.5)	
	B- [80-82.5)	C- [70-72.5)	D- [60-62.5)	

Final Exam Date and Time: TBD

Final Examination Policy

Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the Traditional Undergraduate Records: Final Exam Schedules site. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

Incompletes and Late Assignments

All assignments are to be submitted/turned in by the beginning of the class session when they are due, including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

Artificial Intelligence (AI) Policy

You are allowed to use Artificial Intelligence (AI) tools (e.g., ChatGPT, Gemini Pro 1.5, GrammarlyGo, Perplexity, etc) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course. If you have any doubts about using AI, please gain permission from the instructor.

PLNU Academic Accommodations Policy

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center, by email or phone at 619-849-2533. Once a student's eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines approved accommodations. Professors are able to view a student's approved accommodations through Accommodate.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their approved accommodations in that particular course. Accommodations are not retroactive; as such, clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes.

Students who need accommodations for a disability-related need should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. In accordance with ADA, accommodations cannot constitute a fundamental alteration to course outcomes; therefore, planning ahead is vital in establishing appropriate accommodations for equal access to this course. It is the student's responsibility to make the first contact with the EAC. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC eligibility process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any accommodations.

Additional Course Information

Additional PLNU policies and practices that apply to this course can be found at the following link: https://docs.google.com/document/d/1SoL5YMfCv_5cobhBwrDjbcZJzNKKTCfM/edit?usp=sharing&ouid=104297418648613020764&rtpof=true&sd=true

Assignments At-A-Glance

Assignments for this course will consist of written homework, quizzes, exams and a final exam. Please refer to the Canvas course for more information on these assignments.

LomaBooks Instructions for Students

This course is part of our course material delivery program, **LomaBooks**. The bookstore will provide each student with a convenient package containing all required physical materials; all digitally delivered materials will be integrated into Canvas.

You should have received an email from the bookstore confirming the list of materials that will be provided for each of your courses and asking you to select how you would like to receive any printed

components (in-store pick up or home delivery). If you have not done so already, please confirm your fulfillment preference so the bookstore can prepare your materials.

For more information about **LomaBooks,** please go: HERE

Tentative schedule

Week	Topics
1 8/31 - 9/4	Review, Proofs & The Real and Complex Number Systems
2 9/7 - 9/11	Review, Proofs & The Real and Complex Number Systems
3 9/14 - 9/18	Basic Topology & Metric Spaces
4 9/21 - 9/25	Basic Topology & Metric Spaces
5 9/28 - 10/2	More on Limits & Continuity
6 10/5 - 10/9	More on Limits & Continuity Review for Mid Term
7 10/12 - 10/16	Mid Term & More on Differentiation
8 10/19 - 10/23	More on Differentiation (Fall Break Day)
9 10/26 - 10/30	More on Integration
10 11/2 - 11/6	More on Integration
11 11/9 – 11/13	Review Series, Sequences and Series of Functions
12 11/16 – 11/20	Sequences and Series of Functions
13 11/23- 11/27	Sequences and Series of Functions (Thanksgiving Break)
14 11/30 – 12/4	Lebesgue Theory (measurable sets, etc.)

15 12/7 – 12/11	Lebesgue Theory (measurable sets, etc.)
Finals 12/14 – 12/ 18	Final Exam TBD