POINT LOMA NAZARENE UNIVERSITY	**Department: Mathematical, Information and Computer Sciences** **Class: MTH3012 Number Theory with Proofs** **Number of Units: 2** **Class Time/Location: WF 8:30-9:30 AM Rohr Science 295** **Final: 7:30-10:00 AM on Friday May 9, 2025**
Spring 2025	

Instructor: Maria Zack, Ph.D.

Phone: 619.849.2458

Email: mzack@pointloma.edu

Office hours:

In Person or Google Meet. Use this linkLinks to an external site. to book an appointment.

These are the times that I work to hold open for appointments. If none of them work you can email me to see if we can find another time. You can come to my office or join via Google meetings. My office is RS246.

Monday 1:00-2:00 PM
Tuesday 8:30-10:00 AM and 1:00-2:00 PM
Wednesday 1:45-2:45 PM
Thursday 8:30-10:00 AM
Friday 2:00-3:00 PM

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

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

MTH 3012 - Number Theory with Proofs (2)

An introduction to proofs using the study of natural numbers, integers, prime factorization, divisibility, congruences, multiplicative functions, continued fractions, quadratic residues. Methods used include investigation, conjecture, inductive and deductive proofs. Offered on a Quad basis.

Prerequisite(s): MTH 1074 with a grade of C- or higher.

COURSE LEARNING OUTCOMES

1. Students will be able to write proofs.
2. Students will be able to apply their mathematical knowledge and critical thinking to solve problems. (CC: CT)
3. Students will be able to speak about their work with precision, clarity and organization. (CC: OC)
4. Students will be able to write about their work with precision, clarity and organization. (CC: WC)
5. Students will collaborate effectively in teams.

Assessed in this class: Students will be able to write proofs.

Signature Assignment: A graded proof which is a "Proof of the Week."

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

Elementary Number Theory by Gareth Jones and J. Mary Jones

COURSE CREDIT HOUR 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 2 unit class delivered over fifteen weeks. Specific details about how the class meets the credit hour requirement can be provided upon request. (Based on 37.5 hours of student engagement per credit hour.)

ASSESSMENT AND GRADING

Graded Components

- **Homework**: Homework will be assigned daily and will be due at the start of class the Friday of the following week. But do your homework every day or you will end up struggling.
- **Projects:** There will be projects assigned some weeks and they will replace class meetings so that if it is a group project, you will have the class time to work on them.
- **Proof of the Week**: There will be 4-5 of these proofs assigned throughout the semester. They are an opportunity for you to show your progress in proof writing and they will be graded very carefully.
- **Examinations and the Final Examination**. Examinations and the Final Examination 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.
- **Final Exam 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.
- **Late work will not be accepted** without prior consent or a well-documented emergency.
- 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.

Grading Distribution	Percent
Homework	25
Projects	12
Exam	20
Proof of the Week	13
Final Exam	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 Exam or the Final Exam in order to pass the class. That is, a score of 60% must be achieved on one of the Exams, 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**
+		87.5- 90	77.5-80	67.5-70	
	92.5 -100	82.5-87.5	72.5-77.5	62.5 -67.5	0-60
_	90-92.5	80-82.5	70-72.5	60-62.5	

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.

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.

ARTIFICIAL INTELLIGENCE (AI) POLICY

You may not use AI to complete any of the work for this course. This class is designed to teach you how to write proofs and you will not learn that essential skill by using AI to write your proofs (not to mention the fact that AI write incorrect and incoherent proofs).

PLNU ACADEMIC ACCOMODATIONS 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 (EAC@pointloma.edu or 619-849-2486). 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 allowed accommodations. The EAC makes accommodations available to professors at the student's request.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course. Accommodations are not retroactive so 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 should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. 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 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 special accommodations.

ADDITIONAL PLNU POLICIES FOR THIS COURSE

Additional PLNU policies and practices that apply to this course can be found at the following link: https://docs.google.com/document/d/18i1pUoY0iCfB8w7JKxVvACQW309X-JRB/edit?usp=sharing&ouid=116164865489739533893&rtpof=true&sd=true

Course Summary:

Date	Details	Due
Fri Jan 17, 2025	Assignment Week 1 Syllabus Quiz	due by 8:30am
Fri Jan 24, 2025	Assignment Week 1 Homework	due by 8:30am
Fri Jan 31, 2025	Assignment Week 2 Homework	due by 8:30am
Fri Feb 7, 2025	Assignment Project: Group Proofs	due by 8:30am
	Assignment Week 3 Homework	due by 8:30am
	Assignment Proof of the Week 1	due by 2:55pm
Fri Feb 14, 2025	Assignment Week 4 Homework	due by 8:30am
Fri Feb 21, 2025	Assignment Week 5 Homework	due by 8:30am
Fri Feb 28, 2025	Assignment Week 6 Homework	due by 8:30am
	Assignment Proof of the Week 2	due by 2:55pm
Wed Mar 5, 2025	Assignment Exam	due by 3:50pm
Fri Mar 7, 2025	Assignment Week 7 Homework	due by 8:30am
Fri Mar 21, 2025	Assignment Project: Induction	due by 8:30am
	Assignment Week 8 Homework	due by 8:30am
Fri Mar 28, 2025	Assignment Week 10 Homework	due by 8:30am

Date	Details	Due
	Assignment Proof of the Week 3	due by 2:55pm
Fri Apr 4, 2025	Assignment Week 11 Homework	due by 2:55pm
Mon Apr 7, 2025	Assignment Video Class Work for March 22	due by 2:55pm
Fri Apr 11, 2025	Assignment Week 12 Homework	due by 8:30am
	Assignment Project: Chinese Remainder Theorem	due by 2:55pm
	Page Video April 5, 2024	to do: 2:55pm
Fri Apr 25, 2025	Assignment Proof of the Week 4	due by 2:55am
	Assignment Week 13 Homework	due by 8:30am
	Assignment Week 14 Homework	due by 8:30am
Fri May 2, 2025	Assignment Project Chapter 4 and 5 Proofs	due by 8:30am
	Assignment Week 15 Homework	due by 8:30am
Fri May 9, 2025	Assignment Week 16 Homework	due by 8:30am
	Assignment Final Exam	due by 10am