


Syllabus

 <p>POINT LOMA NAZARENE UNIVERSITY</p>	<p>Department: Mathematical, Information and Computer Sciences</p> <p>Class: MTH3012 Number Theory with Proofs</p> <p>Number of Units: 2</p> <p>Class Time/Location: MF 2:55-3:50 PM Rohr Science 295</p> <p>Final: 1:30-4:00 PM on Friday May 2, 2024</p>
<p>Spring 2024</p>	

Instructor: Maria Zack, Ph.D.

Phone: 619.849.2458

Email: mzack@pointloma.edu

Office hours:

On Zoom - [Click here for appointment](https://calendar.google.com/calendar/selfsched?sstoken=UUphMmZJc2tIVTFKfGRIZmF1bHR8YTE5OTI3YWQxZDFhZDc4MDExZWQ5ZjU3MDRhNmNkNTI)  (<https://calendar.google.com/calendar/selfsched?sstoken=UUphMmZJc2tIVTFKfGRIZmF1bHR8YTE5OTI3YWQxZDFhZDc4MDExZWQ5ZjU3MDRhNmNkNTI>)

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. Please note that some sessions are Zoom only and are shown with the statement "Zoom only" after the time. The others can be Zoom or In-Person (RS246).

Monday 10:30-11:30 AM

Tuesday 8:00-9:30 AM and 2:00-3:00 PM

Wednesday By appointment only

Thursday 5:00-6:00 PM (Zoom only)

Friday 11:15 AM - 12:00 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 demonstrate facility with algebraic structures.
3. Students will be able to speak about their work with precision, clarity and organization.
4. Students will be able to write about their work with precision, clarity and organization.
5. Students will collaborate effectively in teams.
6. Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.
7. Students will be able to gather relevant information, examine information and form a conclusion based on that information.

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. 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. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. 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 consider changing the exam date and time for that particular student.
- **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 a 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.

SPIRITUAL CARE

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.

If you have questions, a desire to meet with the chaplain or have prayer requests you can contact your professor or the [Office of Spiritual Life and Formation](https://www.pointloma.edu/offices/student-life-formation) (<https://www.pointloma.edu/offices/student-life-formation>).

STATE AUTHORIZATION

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on [State Authorization](https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures) (<https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures>) to view which states allow online (distance education) outside of California.

PLNU COPYRIGHT POLICY

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.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. 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. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the



university Catalog. See **Academic Policies** (<https://pointloma-public.courseleaf.com/tug-catalog/academic-general-policies/>) for definitions of kinds of academic dishonesty and for further policy information.

ARTIFICIAL INTELLIGENCE (AI) POLICY

Use of Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski) in creating written work for this class is not permitted, and use of these tools will be treated as plagiarism.

PLNU ACADEMIC ACCOMMODATIONS POLICY

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu (<mailto:EAC@pointloma.edu>) or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

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 and/or if they do not wish to utilize some or all of the elements of their AP in that course.

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.

LANGUAGE AND BELONGING

Point Loma Nazarene University faculty are committed to helping create a safe and hospitable learning environment for all students. As Christian scholars we are keenly aware of the power of language and believe in treating others with dignity. As such, it is important that our language be equitable, inclusive, and prejudice free. Inclusive/Bias-free language is the standard outlined by all major academic style guides, including MLA, APA, and Chicago, and it is the expected norm in university-level work. Good writing and speaking do not use unsubstantiated or irrelevant generalizations about personal qualities such as age, disability, economic class, ethnicity, marital status, parentage, political or religious beliefs, race, gender, sex, or sexual orientation. Inclusive language also avoids using stereotypes or terminology that demeans persons or groups based on age, disability, class, ethnicity, gender, race, language, or national origin. Respectful use of language is particularly important when referring to those outside of the religious and lifestyle commitment



those in the PLNU community. By working toward precision and clarity of language, we mark ourselves as serious and respectful scholars, and we model the Christ-like quality of hospitality.

You may report an incident(s) using the [Bias Incident Reporting Form](https://cm.maxient.com/reportingform.php?PointLoma&layout_id=5) (https://cm.maxient.com/reportingform.php?PointLoma&layout_id=5).

SEXUAL MISCONDUCT AND DISCRIMINATION

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at pointloma.edu/Title-IX (<http://pointloma.edu/Title-IX>). Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at counselingservices@pointloma.edu (<mailto:counselingservices@pointloma.edu>) or find a list of campus pastors at pointloma.edu/title-ix (<http://pointloma.edu/title-ix>).

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See [Academic Policies](https://catalog.pointloma.edu/content.php?catoid=52&navoid=2919#Class_Attendance) (https://catalog.pointloma.edu/content.php?catoid=52&navoid=2919#Class_Attendance) in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

USE OF TECHNOLOGY

In order to be successful in the online or hybrid environment, you'll need to meet the minimum technology and system requirements; please refer to the [Technology and System Requirements](https://help.pointloma.edu/TDClient/1808/Portal/KB/ArticleDet?ID=108349) (<https://help.pointloma.edu/TDClient/1808/Portal/KB/ArticleDet?ID=108349>) information. Additionally, students are required to have headphone speakers, microphone, or webcams compatible with their computer available to use. Please note that any course with online proctored exams require a computer with a camera (tablets are not compatible) to complete exams online.



Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.

LOMA WRITING CENTER

The Loma Writing Center exists to help all members of the PLNU community cultivate transferable writing skills to engage their academic, professional, personal, and spiritual communities. We work toward this goal by conducting one-on-one consultation sessions, supporting writing education across the PLNU community, and participating in ongoing writing center research.

Getting feedback from the Loma Writing Center while you're in the process of working on an assignment is a great way to improve the quality of your writing and develop as a writer. You are encouraged to talk with a trained writing consultant about getting started on an assignment, organizing your ideas, finding and citing sources, revising, editing for grammar and polishing final drafts, and more. For information about how to make in-person or online appointments, see [Loma Writing Center webpage \(https://www.pointloma.edu/centers-institutes/loma-writing-center\)](https://www.pointloma.edu/centers-institutes/loma-writing-center) or visit the Loma Writing Center on the first floor of the Ryan Library room 221



Monday	Tuesday	Wednesday	Thursday	Friday
Intro Theorems Online Syllabus Quiz 8-Jan	9-Jan	10-Jan	11-Jan	Intro Theorems 12-Jan
MLK DAY 15-Jan	16-Jan	17-Jan	18-Jan	Intro Theorems Proof of the Week #1 19-Jan
Intro Theorems 22-Jan	23-Jan	24-Jan	25-Jan	PROJECT: Group Proofs No lecture 26-Jan
Intro Theorems 29-Jan	30-Jan	31-Jan	1-Feb	Intro Theorems 2-Feb
Euclidean Algorithm 5-Feb	6-Feb		8-Feb	Jones Chapter 1 9-Feb
Jones Chapter 1 12-Feb	13-Feb		15-Feb	Jones Chapter 1 Proof of the Week #2 16-Feb
Jones Chapter 1 19-Feb	20-Feb		22-Feb	Jones Chapter 1 Exam Review 23-Feb
EXAM 26-Feb	27-Feb	7-Jan	29-Feb	Jones Chapter 2 Proof of the Week #3 1-Mar
SPRING BREAK 4-Mar	SPRING BREAK 5-Mar	SPRING BREAK 14-Jan	SPRING BREAK 5-Mar	SPRING BREAK 6-Mar
Jones Chapter 2 11-Mar	12-Mar	13-Mar	14-Mar	PROJECT: Induction No lecture 15-Mar
Jones Chapter 2 18-Mar	19-Mar	20-Mar	21-Mar	PROJECT: Chinese Remainder Thm No lecture 22-Mar
CRT Discussion 25-Mar	26-Mar	27-Mar	EASTER BREAK 28-Mar	EASTER BREAK 29-Mar
EASTER BREAK 1-Apr	2-Apr	3-Apr	4-Apr	Jones Chapter 3 Vido - No class 5-Apr
Jones Chapter 3 Proof of the Week #4 8-Apr	9-Apr	10-Apr	11-Apr	Jones Chapter 3 12-Apr
Jones Chapter 4 15-Apr	16-Apr	17-Apr	18-Apr	PROJECT: Proofs No lecture 19-Apr
Jones Chapter 4 22-Apr	23-Apr	24-Apr	25-Apr	Jones Chapter 5 26-Apr
29-Apr	30-Apr	1-May	2-May	TAKE HOME DUE AT NOON 3-May

Course Summary:

Date	Details	Due
Fri Jan 12, 2024	Assignment Week 1 Syllabus Quiz	due by 2:55pm
Fri Jan 19, 2024	Assignment Week 1 Homework	due by 2:55pm
Fri Jan 26, 2024	Assignment Week 2 Homework	due by 2:55pm
	Assignment Project: Group Proofs	due by 2:55pm
Fri Feb 2, 2024	Assignment Proof of the Week 1	due by 2:55pm
	Assignment Week 3 Homework	due by 2:55pm
Fri Feb 9, 2024	Assignment Week 4 Homework	due by 2:55pm
Fri Feb 16, 2024	Assignment Week 5 Homework	due by 2:55pm
	Assignment Proof of the Week 2	due by 2:55pm
Fri Feb 23, 2024	Assignment Week 6 Homework	due by 2:55pm
Mon Feb 26, 2024	Assignment Exam	due by 3:50pm
Fri Mar 1, 2024	Assignment Week 7 Homework	due by 2:55pm
Fri Mar 15, 2024	Assignment Week 8 Homework	due by 2:55pm
	Assignment Project: Induction	due by 2:55pm
Fri Mar 22, 2024	Assignment Week 10 Homework	due by 2:55pm

Date	Details	Due
Fri Mar 29, 2024	Assignment Proof of the Week 3	due by 2:55pm
	Assignment Project: Chinese Remainder Theorem	due by 2:55pm
Fri Apr 5, 2024	Assignment Week 11 Homework	due by 2:55pm
	Assignment Week 12 Homework	due by 2:55pm
	Page Video April 5, 2024	to do: 2:55pm
Fri Apr 12, 2024	Assignment Video Class Work for April 5	due by 2:55pm
	Assignment Week 13 Homework	due by 2:55pm
Fri Apr 19, 2024	Assignment Proof of the Week 4	due by 2:55am
	Assignment Week 14 Homework	due by 2:55am
Fri Apr 26, 2024	Assignment Project Chapter 4 and 5 Proofs	due by 2:55pm
	Assignment Week 15 Homework	due by 2:55pm
Fri May 3, 2024	Assignment Final Exam	due by 1:30pm
	Assignment Week 16 Homework	due by 1:30pm