Syllabus

To-Do Date: Mar 1 at 11:59pm

	Department/School Name: Mathematical, Information and Computer Sciences **Course Number and Name: MTH3012 Number Theory with Proofs** **Number of Units: 2** **Class Time/Location: TR 8:30-9:25 Rohr Science 295**
Spring 2021	

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=UUphMmZJc2tlVTFKfGRlZmF1bHR8YTE5OTI3YWQxZDFhZDc4MDExZWQ5ZjU3MDRhNmNkNTI)

These are the times that I hold open for appointments. If none of them work you can email me to see if we can find another time.

Monday 7:30-8:30 AM & 11:00 AM - noon

Tuesday 2:00-3:00 PM

Wednesday 1:00-2:00 PM

Thursday 7:30-8:30 AM & 3:00-4:00 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.)

Distribution of Student Learning Hours

Category	Time Expectation in Hours
Synchronous Class Meetings	28
Homework	25
Collaborative Activities	3.25
Projects (time outside of class time)	4
Videos, Reading, Notes and Problems	10.25
Studying for Exams	12
Total Hours	82.5

ASSESSMENT AND GRADING

Graded Components

- **Homework**: Homework will be assigned daily and will be due at the start of class the Thursday of the following week. But do your homework every day or you will end up struggling.
- **Collaborative Activities**: I will be assigning things in class for you to work on in groups. You should able to complete most or all of them in class. The activity will be due in Canvas by midnight on Friday.
- **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 (on Thursdays) 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. Up to a maximum of one homework assignment will be accepted up to 3 days late provided that consent is received from the professor before it is due. Homework assignments that are submitted late without prior consent will be recorded with a score of zero. If more than half of the homework assignments are submitted on time, then the lowest homework score will be dropped from the calculations of the homework grade.
- 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
Collaborative Activities	5
Projects	10
Exam	20
Proof of the Week	10
Final Exam	25
Attendance	5
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

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	

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)** to view which states allow online (distance education) outside of California.

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.

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 (http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278)** for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (**DRC@pointloma.edu (mailto:DRC@pointloma.edu)** or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

PLNU ATTENDANCE AND PARTICIPATION POLICY

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 is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in 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 (http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278)** for further information about class attendance.

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 students have questions, a desire to meet with the chaplain or have prayer requests you can contact the **Office of Spiritual Development (https://www.pointloma.edu/offices/spiritual-development)**

Recent Announcements

iPad Notes
(https://canvas.pointloma.edu/courses/55089/discussion_topics/344744)
I have put my notes from today up in Canvas. Dr. Zack

Posted on:
Mar 4, 2021 at 5:12pm

No Title
(https://canvas.pointloma.edu/courses/55089/discussion_topics/343629)
I put my notes from the ipad up and also fixed the homework for today…

Posted on:
Mar 2, 2021 at 9:33am

MTH3012-1 SP21 - Number Theory With Proofs

Jump to Today ✎ Edit

COURSE SCHEDULE AND ASSIGNMENTS

The full course syllabus may be found here: **Syllabus**

Textbook: *Elementary Number Theory* by Gareth A. Jones and Josephine M. Jones

If you desire to see your work organized by week, you are able to access the weekly **modules**.

The table below lists the weekly calendar and the list below it shows the assignments and tasks and their due dates.

I am going to be experimenting with the structure of the class in the hybrid format. Here is my starting plan:

> Tuesdays: we will meet the full time (on Zoom until we are in "red" and can meet in person). **This is a small class so there will be plenty of room to spread out.**
>
> Thursdays: we will meet the full time (on Zoom until we are in "red" and can meet in person) but some weeks you will have a project (some are group projects). It is marked in the calendar if it is project or meeting.

Zoom Link: https://pointloma.zoom.us/j/92861939608 (https://pointloma.zoom.us/j/92861939608)

Monday	Tuesday	Wednesday	Thursday	Friday
1-Mar	2-Mar Intro Theorems Online Syllabus Quiz	3-Mar	4-Mar Intro Theorems	5-Mar
8-Mar	9-Mar Intro Theorems Proof of the Week #1	10-Mar	11-Mar Intro Theorems	12-Mar
15-Mar	16-Mar Intro Theorems	17-Mar	18-Mar **PROJECT: Group Proofs** No lecture	19-Mar
22-Mar	23-Mar Euclidean Algorithm Project	24-Mar	25-Mar Euclidean Algorithm	26-Mar
29-Mar	30-Mar Euclidean Algorithm	31-Mar **Wellness Day**	1-Apr Jones Chapter 1	2-Apr
5-Apr	6-Apr Jones Chapter 1	7-Apr	8-Apr Jones Chapter 1 Proof of the Week #2	9-Apr
12-Apr	13-Apr Jones Chapter 1	14-Apr	15-Apr **PROJECT: Induction** No lecture	16-Apr
19-Apr	20-Apr Exam Review Jones Chapter 2 Proof of the Week #3	21-Apr	22-Apr **EXAM**	23-Apr
26-Apr	27-Apr Jones Chapter 2	28-Apr	29-Apr Jones Chapter 2	30-Apr
3-May	4-May Jones Chapter 3 Proof of the Week #4	5-May **Wellness Day**	6-May Jones Chapter 3	7-May
10-May	11-May Jones Chapter 3	12-May	13-May **PROJECT: Chinese Remainer Thm** No lecture	14-May
17-May	18-May CRT Discussion	19-May	20-May Jones Chapter 4	21-May
24-May	25-May Jones Chapter 4 Proof of the Week #5	26-May	27-May **PROJECT: Proofs** No lecture	28-May
31-May	1-Jun Jones Chapter 5	2-Jun	3-Jun Final Exam Preparation	4-Jun
7-Jun	8-Jun	9-Jun	10-Jun **FINAL 7:30-10:00 AM**	11-Jun

Link to a a downloadable PDF of the schedule: **2021 Visual Schedule MTH3012.pdf**

Quick Links to Resources

Netiquette Guidelines | **Help & Technical Support** | **Technology & System Requirements (https://help.pointloma.edu/TDClient/1808/Portal/KB/ArticleDet?ID=108349)** | **Canvas Student Guides (https://community.canvaslms.com/t5/Student-Guide/tkb-p/student)**

Course Summary:

Date	Details	Due
Mon Mar 1, 2021	**Week 1: Overview**	to do: 8am
	Syllabus	to do: 11:59pm
	Week 1: Videos, Links and Handouts	to do: 11:59pm
Fri Mar 5, 2021	**Week 1: Syllabus Quiz (https://canvas.pointloma.edu/courses/55089/assignments/621573)**	due by 11:59pm

Date	Details	Due
Mon Mar 8, 2021	Week 2: Overview	to do: 8am
	Week 2: Videos, Links and Handouts	to do: 11:59pm
Thu Mar 11, 2021	Week 1: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621514)	due by 8:30am
Fri Mar 12, 2021	Week 2: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621515)	due by 11:59pm
Mon Mar 15, 2021	Week 3: Overview	to do: 8am
	Week 3: Videos, Links and Handouts	to do: 11:59pm
Thu Mar 18, 2021	Proof of the Week 1 (https://canvas.pointloma.edu/courses/55089/assignments/621543)	due by 8:30am
	Week 2: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621516)	due by 8:30am
Fri Mar 19, 2021	Week 3: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621517)	due by 11:59pm
Mon Mar 22, 2021	Week 4: Overview	to do: 8am
	Week 4: Videos, Links and Handouts	to do: 11:59pm
Thu Mar 25, 2021	Project: Group Proofs (https://canvas.pointloma.edu/courses/55089/assignments/621566)	due by 8:30am
	Week 3: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621518)	due by 8:30am
Fri Mar 26, 2021	Week 4: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621519)	due by 11:59pm
Mon Mar 29, 2021	Week 5: Overview	to do: 8am

Date	Details	Due
	Week 5: Videos, Links and Handouts	to do: 11:59pm
Thu Apr 1, 2021	Week 4: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621520)	due by 8:30am
Fri Apr 2, 2021	Exam 1 (https://canvas.pointloma.edu/courses/55089/assignments/621500)	due by 11:59pm
	Week 5: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621521)	due by 11:59pm
Mon Apr 5, 2021	Week 6: Overview	to do: 8am
	Week 6: Videos, Links and Handouts	to do: 11:59pm
Thu Apr 8, 2021	Week 5: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621522)	due by 8:30am
Fri Apr 9, 2021	Week 6: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621523)	due by 11:59pm
Mon Apr 12, 2021	Week 7: Overview	to do: 8am
	Week 7: Videos, Links and Handouts	to do: 11:59pm
Thu Apr 15, 2021	Proof of the Week 2 (https://canvas.pointloma.edu/courses/55089/assignments/621544)	due by 8:30am
	Week 6: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621524)	due by 8:30am
Fri Apr 16, 2021	Week 7: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621525)	due by 11:59pm
Mon Apr 19, 2021	Week 8: Overview	to do: 8am
	Week 8: Videos, Links and Handouts	to do: 11:59pm

Date	Details	Due
Thu Apr 22, 2021	Project: Induction (https://canvas.pointloma.edu/courses/55089/assignments/621542)	due by 8:30am
	Week 7: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621526)	due by 8:30am
Fri Apr 23, 2021	Week 8: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621527)	due by 11:59pm
Mon Apr 26, 2021	Week 9: Overview	to do: 8am
	Week 9: Videos, Links and Handouts	to do: 11:59pm
Thu Apr 29, 2021	Proof of the Week 3 (https://canvas.pointloma.edu/courses/55089/assignments/621545)	due by 8:30am
	Week 8: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621528)	due by 8:30am
Fri Apr 30, 2021	Week 9: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621529)	due by 11:59pm
Mon May 3, 2021	Week 10: Overview	to do: 8am
	Week 10: Videos, Links and Handouts	to do: 11:59pm
Thu May 6, 2021	Week 9: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621530)	due by 8:30am
Fri May 7, 2021	Week 10: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621503)	due by 11:59pm
Mon May 10, 2021	Week 11: Overview	to do: 8am
	Week 11: Videos, Links and Handouts	to do: 11:59pm

Date	Details	Due
Thu May 13, 2021	Proof of the Week 4 (https://canvas.pointloma.edu/courses/55089/assignments/621546)	due by 8:30am
	Week 10: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621504)	due by 8:30am
Fri May 14, 2021	Week 11: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621505)	due by 11:59pm
Mon May 17, 2021	Week 12: Overview	to do: 8am
	Week 12: Videos, Links and Handouts	to do: 11:59pm
Thu May 20, 2021	Project: Chinese Remainder Theorem (https://canvas.pointloma.edu/courses/55089/assignments/621568)	due by 8:30am
	Week 11: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621506)	due by 8:30am
Fri May 21, 2021	Week 12: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621507)	due by 11:59pm
Mon May 24, 2021	Week 13: Overview	to do: 8am
	Week 13: Videos, Links and Handouts	to do: 11:59pm
Thu May 27, 2021	Week 12: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621508)	due by 8:30am
Fri May 28, 2021	Week 13: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621509)	due by 11:59pm
Mon May 31, 2021	Week 14: Overview	to do: 8am
	Week 14: Videos, Links and Handouts	to do: 11:59pm

Date	Details	Due
Thu Jun 3, 2021	Project: Lemma 5.1 Proof (https://canvas.pointloma.edu/courses/55089/assignments/621572)	due by 8:30am
	Week 13: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621510)	due by 8:30am
Fri Jun 4, 2021	Week 14: Collaborative Activity (https://canvas.pointloma.edu/courses/55089/assignments/621511)	due by 11:59pm
Mon Jun 7, 2021	Week 15: Overview	to do: 8am
Thu Jun 10, 2021	Week 14: Homework (https://canvas.pointloma.edu/courses/55089/assignments/621512)	due by 7:30am
Fri Jun 11, 2021	Attendance Points (https://canvas.pointloma.edu/courses/55089/assignments/621499)	due by 11:59pm
	FINAL EXAM (https://canvas.pointloma.edu/courses/55089/assignments/621502)	due by 11:59pm