

Syllabus



School of STEM
Department of Mathematical, Information and Computer Sciences

MTH3073—Mathematical Modeling

3 Units (TR, 11:00am-12:15pm, Rohr Science 365)

Fall 2024 | September 3 – December 20

Instructor: Carlson Triebold

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Office hours: Posted in Canvas

Final Exam: 12/17 at 10:30am

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

A problem-based course that explores mathematical modeling techniques using a variety of computational methods. Also examines how mathematics can be applied to answer specific questions. Includes problems from biology, chemistry, physics, business and other non-mathematical disciplines. Written report and oral presentation are required.

COURSE LEARNING OUTCOMES

1. Students will be able to apply their mathematical knowledge to solve problems.
2. Students will be able to use technology to solve problems.
3. Students will be able to speak about their work with precision, clarity, and organization.
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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.
8. Students will be able to understand and create arguments supported by quantitative evidence, and be able to clearly communicate those arguments in a variety of formats.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

1. *A Course in Mathematical Modeling* by Mooney & Swift (ISBN: 9781470466169)

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 3-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 regularly from the text. A homework assignment is late if it is not submitted at the beginning of class on the due date. Late homework will not be accepted. Your lowest homework score will be dropped.
- **Projects:** Projects will be assigned regularly from the text. A project assignment is late if it is not submitted at the beginning of class on the due date. Late project assignments will not be accepted. Your lowest project score will be dropped.
- **Examinations and the Final Project:** Examinations will include problems and questions over material assigned in the text, readings and handouts, as well as material presented in class. The final project will include the creation and presentation of a poster detailing original research related to mathematical modeling. No examination or presentation shall be missed without a well-documented emergency beyond your control. A score of zero will be assigned for an examination or presentation that is missed without a well-documented emergency beyond your control.
- **Late work will not be accepted.** Homework and project 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.

Grading Distribution	Percent
Homework	10
Projects	35
Two Exams (10% Each)	20
Final Project	35
Total	100

FINAL EXAM:

Date and Time: Tuesday, December 17th from 10:30am-1:00pm.

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.

Grading Scale

Grades are based on the number of points accumulated throughout the course with the following exception. A student must pass the Final Project in order to pass the class. That is, a score of 60% must be achieved on the Final Project, 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
+		[87.5-90.0)	[77.5-80.0)	[67.5-70.0)	
	[92.5-100.0]	[82.5-87.5)	[72.5-77.5)	[62.5-67.5)	[0-60)
-	[90.0-92.5)	[80.0-82.5)	[70.0-72.5)	[60.0-62.5)	

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 [Class 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.

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 their physical location. Refer to the map on [State Authorization](#) 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 their 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 RECORDING NOTIFICATION

In order to enhance the learning experience, please be advised that this course may be recorded by the professor for educational purposes, and access to these recordings will be limited to enrolled students and authorized personnel.

Note that all recordings are subject to copyright protection. Any unauthorized distribution or publication of these recordings without written approval from the University (refer to the Dean) is strictly prohibited.

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. For all student appeals, faculty should follow and students may appeal using the procedure in the university Catalog. See [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

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 (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.

SEXUAL MISCONDUCT AND DISCRIMINATION

Point Loma Nazarene University faculty are committed to helping create a safe learning environment for all students. 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 help and support are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, it is 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 or find a list of campus pastors at pointloma.edu/title-ix

If you (or someone you know) have experienced other forms of discrimination or bias, you can find more information on reporting and resources at www.pointloma.edu/bias

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 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 withdrawal date or, after that date, receive an "F" grade.

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 your professor or the [Office of](#)

Spiritual Life and Formation.

	Week	Tuesday	Thursday
September	1	3 Chapter 1	5 Chapter 1
	2	10 Chapter 1	12 Chapter 1
	3	17 Chapter 2	19 Chapter 2
	4	24 Chapter 6	26 Chapter 6
October	5	1 SIR models	3 Chapter 3
	6	8 Chapter 3	10 Chapter 3
	7	15 Chapter 3	17 Review for exam I
	8	22 Exam I	24 Fall Break
	9	29 Chapter 3	31 Chapter 3
November	10	5 Chapter 3	7 Chapter 3
	11	12 Chapter 3	14 Chapter 4
	12	19 Chapter 4	21 Chapter 4
	13	26 Chapter 4	28 Thanksgiving Break
December	14	3 Group meetings	5 Group meetings
	15	10 Review for exam II	12 Exam II
	16	17 Final Presentations 10:30am-1:00pm	19