School of STEM: Department of Mathematical, Information and Computer Sciences

MTH3073—Mathematical Modeling

3 Units

Fall 2026

TR 8:00 – 9:15am

Rohr Science 365

Final Exam: Tuesday, 12/15, 7:30 – 10:00am

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Office Location and Office Hours: Rohr Science 228, times posted on Canvas

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.

Program and 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

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.

1. *A Course in Mathematical Modeling* by Mooney & Swift

Assessment and Grading

Grading distribution:

- Final Exam: 20%
- Final Project: 50%
- Homework: 25%
- Attendance and Participation: 5%

Grades will be based on the following:

- **Homework:** Homework problems will be assigned regularly and posted on Canvas. Please check regularly to ensure that you are keeping up with the homework. Late homework will not be accepted. Your lowest homework score will be dropped.
- **Final Exam and the Final Project:** The Final Exam and the Final Project will include problems and questions over material assigned in the text, readings and handouts, as well as material presented in class. No exam or presentation shall be missed without a well-documented emergency beyond your control. A score of zero will be assigned for an exam that is missed without a well-documented emergency beyond your control.

- **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.). For this reason, your lowest homework score will be dropped. There are no exceptions to this policy, so please use your dropped assignments wisely.

Grades are based on the number of points accumulated throughout the course with the following exception. A student must pass the Final Project 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.

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 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

Though not recommended, 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. Any violation of this policy in this course is subject to an academic honesty violation. 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.

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 **LomaBooks** materials.

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?amp;ouid=104297418648613020764&rtpof=true&sd=true

Fall 2026 **MTH 3073 Calendar**

	Week	Tuesday	Thursday
September	1	1 Introduction	3 Continuous stochasticity
	2	8 Continuous stochasticity	10 Discrete dynamical systems
	3	15 Discrete dynamical systems	17 Discrete dynamical systems
	4	22 Discrete stochasticity	24 Discrete stochasticity
	5	29 Continuous models	1 Continuous models
October	6	6 Continuous models	8 Continuous models
	7	13 Stages, states, and classes	15 Stages, states, and classes
	8	20 Stages, states, and classes	22 Fall Break
	9	27 Team projects day	29 Stages, states, and classes
November	10	3 Team projects day	5 Empirical modeling
	11	10 Team projects day	12 Empirical modeling
	12	17 Team projects day	19 Empirical modeling
	13	24 Team projects day	26 Thanksgiving Break
December	14	1 Poster Presentations* *The date of the poster presentations is subject to change.	3 Empirical modeling
	15	8 TBD	10 Empirical modeling
	16	15 Final Exam 7:30-10:00am	17