

Point Loma Nazarene University
MTH333 Differential Equations
3 Units, TuTh 11:00pm–12:15pm
Latter Hall LA102

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Course Description: Ordinary differential equations, solutions by analytical and numerical methods in the context of real-world applications. A brief introduction to partial differential equations and Fourier series.

Prerequisite: Calculus III (MTH274).

Textbook: *Fundamentals of Differential Equations*, Eighth Edition, by Nagle, Saff and Snider.

Other Requirements: There will be occasional programming assignments. Access to MATLAB® or similar software is required. Freemath and Octave are two free alternatives to MATLAB, either of which will suffice for this course.

Course Learning Outcomes: Students will be able to apply their mathematical knowledge to solve problems. Students will be able to use technology to solve problems.

Examinations: There will be two midterms and a final exam. The final exam is comprehensive and will be held on **Thursday, May 5, 2016, 10:30am–1:00pm, Latter Hall LA102**. All or some portion of the exams may be take-home, in which case they will be due on the date of the scheduled exam.

Homework: Homework sets will be assigned for each class period and will be due at the beginning of the class period on the Tuesday of the following week (usually). *Doing all of the assigned homework before the next class will almost certainly ensure that you successfully master the course material. The exams will be like the homework; there should be no surprises.*

You must be persistent in solving homework problems; when you need help, ask me, fellow classmates, other friends, the internet, or your favorite MICS professor, but be sure to keep up with the pace of the class.

Office Hours: I am an adjunct instructor employed full-time off-campus. As such, I will not hold regularly scheduled office hours, but I will be available to meet with you by appointment (usually before or after class). Do not hesitate to ask questions during lecture, or to approach me afterwards.

Discussion on Piazza: This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates and myself. Rather than email questions to me, I encourage you to post your questions on Piazza. You can also reinforce your understanding of the course material by answering other students' questions.

Participation on Piazza will be graded as an assignment in the homework category. You will get one point for each question asked or answered on Piazza, for up to 20 points, but the assignment will only be scored out of 10 points. That means that you are **required** to ask or answer 10 questions

(roughly one per homework assignment), but you can also get up to 10 extra credit points for asking or answering more.

If you have any problems or feedback for the developers, email team@piazza.com. Find our class page at: <https://piazza.com/pointloma/spring2016/mth333/home>

Grade Distribution:

| | |
|---------------|-----|
| Projects | 20% |
| Homework | 15% |
| Midterm Exams | 40% |
| Final Exam | 25% |

Letter Grade Distribution:

| | | | |
|---------------|----|---------------|----|
| ≥ 93.00 | A | 73.00 - 76.99 | C |
| 90.00 - 92.99 | A- | 70.00 - 72.99 | C- |
| 87.00 - 89.99 | B+ | 67.00 - 69.99 | D+ |
| 83.00 - 86.99 | B | 63.00 - 66.99 | D |
| 80.00 - 82.99 | B- | 60.00 - 62.99 | D- |
| 77.00 - 79.99 | C+ | ≤ 59.99 | F |

Course Policies:

- In-class exams are closed-book, though you will be allowed a “cheat sheet” (one sheet of paper, no larger than 8.5” × 11”, on both sides of which you may write or type).
- One lowest homework score will be dropped.
- A written assignment or computer assignment is late if it is not received at or before the beginning of class on the due date. Late work will not be accepted.
- Make-up tests will be given only by arrangement with the instructor for reasons of documented emergency.
- Course policies, assignments, and due dates are subject to change at the discretion of the instructor.

Tentative course outline:

Outline is tentative and subject to change.

| Week | Dates | Subject | Sections |
|--------------|---------|--|----------------------------|
| 1 | Th 1/14 | Introduction | 1.1 |
| 2 | Tu 1/19 | Introduction | 1.2,3 |
| | Th 1/21 | First Order Differential Equations | 2.2 |
| 3 | Tu 1/26 | First Order Differential Equations | 2.3,4 |
| | Th 1/28 | First Order Differential Equations | 2.6 |
| 4 | Tu 2/2 | Mathematical Models | 3.2,3,4 |
| | Th 2/4 | Numerical Methods | 1.4, 3.6 |
| | | Hand out Midterm 1 (take home) | |
| 5 | Tu 2/9 | Midterm 1 Due | |
| | | Linear Second-Order Equations | 4.1,2 |
| | Th 2/11 | Linear Second-Order Equations | 4.3,4 |
| 6 | Tu 2/16 | Linear Second-Order Equations | 4.5,6 |
| | Th 2/18 | Linear Second-Order Equations | 4.9,10 |
| 7 | Tu 2/23 | Introduction to Systems | 5.1,2 |
| | | Project 1 Due | |
| | Th 2/25 | Laplace Transforms | 7.2 |
| 8 | Tu 3/1 | Laplace Transforms | 7.3,4 |
| | Th 3/3 | Laplace Transforms | 7.5 |
| SPRING BREAK | | | |
| 9 | Tu 3/15 | Laplace Transforms | 7.6,7 |
| | Th 3/17 | Laplace Transforms | 7.9 |
| 10 | Tu 3/22 | Midterm Review | |
| | Th 3/24 | NO CLASS | |
| 11 | Tu 3/29 | Midterm 2 (May push MT to Thursday) | Covers through Ch. 7 |
| | Th 3/31 | Series Solutions | 8.1,2 |
| 12 | Tu 4/5 | Series Solutions | 8.3,4 |
| | Th 4/7 | Series Solutions | 8.5,6 |
| 13 | Tu 4/12 | Partial Differential Equations | 10.1,2 |
| | Th 4/14 | Partial Differential Equations | 10.3 |
| 14 | Tu 4/19 | Partial Differential Equations | 10.4 |
| | Th 4/21 | Partial Differential Equations | 10.5 |
| 15 | Tu 4/26 | Partial Differential Equations | 10.6 |
| | Th 4/28 | Final Exam Review | |
| | Th 5/5 | FINAL EXAM | Covers all course material |

University Mission: 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 becomes an expression of faith. Being of Wesleyan heritage, we aspire 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.

Attendance: 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 in which a student is registered is considered essential to optimum academic achievement. Therefore, regular attendance and participation in each course are minimal requirements to be met. There are no allowed or excused absences except as approved in writing by the Provost for specific students participating in certain university-sanctioned activities. Excused absences still count toward the 10%–20% limits, but allow students to make up work, quizzes, or tests missed as a result of a university-sanctioned activity. Activities of a unique nature, such as labs or other activities identified clearly on the syllabus, cannot be made up except in rare instances when instructors have given advanced, written approval for doing so. Whenever the number of accumulated absences in a class, for any cause, exceeds ten (10) percent of the total number of class meetings, the faculty member should send an e-mail to the student and the Vice Provost for Academic Administration (VPAA) warning of attendance jeopardy. If more than twenty (20) percent of the total number of class meetings is reported as missed, the faculty member or VPAA may initiate the students de-enrollment from the course without further advanced notice to the student. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of W or WF consistent with university policy in the Grading section of the catalog. There are no refunds for courses where a de-enrollment was processed. For more details see the PLNU catalog:

http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Class_Attendance

Class Enrollment: It is the students 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.

Academic Accommodation: While all students are expected to meet the minimum academic standards for completion of their courses as established by the instructors, students with special needs may require academic accommodations. At Point Loma Nazarene University, students requesting academic accommodations must file documentation with the Disability Resource Center (DRC), located in the Bond Academic Center. Once the student files documentation, the Disability Resource Center contacts the students instructors and provides written recommendations for reasonable and appropriate accommodations to meet the individual needs of the student. This policy assists the university in its commitment to full compliance with Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities (ADA) Act of 1990, and ADA Amendments Act of 2008, all of which prohibit discrimination against students with special needs and guarantees all qualified students equal access to the benefits of PLNU programs and activities. For more details

see the PLNU catalog:

<http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278>

#Academic_Accommodations

Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

Academic Honesty: The Point Loma Nazarene University community holds the highest standards of honesty and integrity in all aspects of university life. Any violation of the university's commitment is a serious affront to the very nature of Point Loma's mission and purpose. Violations of academic honesty include cheating, plagiarism, falsification, aiding academic dishonesty, and malicious interference. The details of PLNU's meaning of each of these words can be found in the PLNU catalog at:

http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Honesty

A student remains responsible for the academic honesty of work submitted in PLNU courses and the consequences of academic dishonesty beyond receipt of the final grade in the class and beyond the awarding of the diploma. Ignorance of these catalog policies will not be considered a valid excuse or defense. Students may not withdraw from a course as a response to a consequence.

A student who is caught cheating on any item of work will receive a zero on that item and may receive an "F" for the semester. See the PLNU Catalog for a further explanation of the PLNU procedures for academic dishonesty.

http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Honesty

Cheating consists of using work other than your own and not citing it, storing answers on calculators or other devices for exams, obtaining copies of old exams, etc.

You may work on homework and projects for this course in groups, however your answers must show enough variation from the work of others to indicate that it was not merely copied.

Final Exam Date and Time: 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. 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 change the exam date and time for that particular student.

Copyright Protected Materials: 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.

Credit Hour: In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for an 3 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Educational Records (FERPA) and Directory Information: The Family Educational Rights and Privacy Act (FERPA) of 1974 as amended affords students certain rights with respect to their education records. These include: 1) the right to inspect and review the student's education records within 45 days of the day the university receives a request for access, 2) the right to request the amendment of the student's education records that the student believes are inaccurate or misleading, 3) the right to consent to disclosures of personally identifiable information contained in the student's education records, and 4) the right to file a complaint with the U.S. Department of Education concerning alleged failures by Point Loma to comply with the requirements of FERPA.

FERPA has specifically identified certain information called directory information that may be disclosed without student consent. Although directory information may be disclosed without student consent, PLNU is not required to release directory information.

The university has defined directory information as name, address (including electronic mail), telephone number, date and place of birth, major field of study, dates of attendance, enrollment status, degrees, honors and awards received, participation in officially recognized activities and sports, weight and height of members of athletic teams, degree candidacy, and the most recent previous educational agency or institution attended. This information may be provided, upon review by the Vice Provost for Academic Administration, as public information or to individuals who demonstrate a valid need to contact students. Photographs of students may also be used in various university publications or on the university website. Students who prefer that their photograph not be used, must inform the Office of Marketing and Creative Services of their request prior to the second Monday of each semester.

The university may disclose education records to college officials with legitimate educational interests. A college official is a person employed by the university; a member of the Board of Trustees; or an individual serving on a committee, such as disciplinary or grievance committees. A college official has a legitimate educational interest if the information aids the official in fulfilling professional functions. PLNU also includes among college officials a student appointed to an official committee or assisting another official in performing tasks and outside service providers who perform an institutional service of function such as attorneys, auditors, and the National Student Clearinghouse. The university may also disclose education records to post-secondary institutions in which a student is seeking or intending to enroll, or is already attending if the disclosure is for purposes related to the students enrollment or transfer.

Questions relative to FERPA policies should be referred to the Office of the Vice Provost for Academic Administration or may be referenced at FERPA.

http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Education_Records__FERPA__and_Directory_Information