



**MICS/Point Loma Nazarene University**

**MTH 2074: Calculus III**

**4.0 Units**

Fall 2020 | MWF 8:30-9:35

**Instructor: Dr. Catherine  
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**Office hours: MWF 10:30- 12, T  
&TH 10-11:30 and MWF 1-2  
Sign up through 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**

Conceptual development of the calculus of functions of more than one variable supported by the use of a symbolic computer algebra system. Limits and continuity, partial derivatives, chain rule, extreme values, Taylor's theorem, multiple integrals, line and surface integrals, Green's Theorem and Stokes' Theorem.

## **COURSE LEARNING OUTCOMES -**

Students will be able to demonstrate facility with analytical concepts.

Students will be able to demonstrate facility with algebraic structures.

Students will be able to apply their mathematical knowledge to solve problems.

Students will be able to use technology to solve problems.

Students will be able to speak about their work with precision, clarity and organization.

Students will be able to write about their work with precision, clarity and organization.

Students will collaborate effectively in teams.

Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.

Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats.

## **REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES**

- **Text: Calculus, by James Stewart, 8th ed. or Calculus: Multivariable Calculus**

ISBN: 978-1305266643 or ISBN: 978-1285740621

- Calculator: A scientific calculator ( including Ln and Cos in the \$10 to \$20 range).
- A platypus, house trained and able to walk on a lead preferred.

## **Comment**

We will try and avoid the following pitfall:

At the beginning college level, visualization is a big part of understanding. Consequently, students who are operating with few mental pictures are not really learning mathematics. Their calculus consists of a vast series of algorithms and a complicated cataloging system which tells them which procedure is used when. The effort put into this kind of teaching and learning is largely wasted: memorized algorithms are soon forgotten and, worse still, such courses perpetuate the idea that math involves doing calculations rather than thinking.

(by Deborah Hughes Hallet in Visualization and Calculus Reform, in the collection Visualization in Teaching and Learning Mathematics, edited by Zimmerman and Cunningham (MAA notes #19))

### **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 4 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.)

| <b>Distribution of Student Learning Hours</b> |                                  |
|---|----------------------------------|
| <b>Category</b>                               | <b>Time Expectation in Hours</b> |
| Synchronous Zoom sessions                     | 22.5                             |
| Reading Assignments                           | 24                               |
| Videos (approx. 1 hour , 11 weeks)            | 11                               |
| Homework (12 at 3 hr each)                    | 36                               |
| Group work ( 15 at 1 hr)                      | 15                               |
| Quizzes                                       | 36                               |
| Exams   | 3.25                             |
| Final Exam                                    | 2.5                              |
| <b>Total Hours</b>                            | <b>150.25</b>                    |

### **ASSESSMENT AND GRADING**

## Graded Components

- **Homework:** Homework will be assigned every class meeting. All homework assigned in a week will be due on Tuesday of the following week. No late homework will be accepted except by prior arrangement (with me) or with a documented emergency. The object of the homework is to learn how to do the problems so there should be calculations on your homework using the terminology and methods of the class and not just an answer. Homework will be scored on a combination of completeness (with work shown) and correctness. A random selection (the same for all people) of the problems will be graded on any homework assignment. The two lowest homework scores will be dropped.
- **Quizzes:** There will be weekly quizzes. Quiz questions will come from the readings and videos assigned before each class session. No late quizzes are accepted except by prior arrangement (with me) or with a documented emergency. The object of the quizzes is to assess what you learned from the videos and readings. The two lowest quiz scores will be dropped.
- **Collaborative Work:** Each week there will be an assignment to be completed in small groups. There is almost a century of research showing that academic achievement, productivity, and self-esteem improve dramatically when students work together in groups. This method emphasizes teamwork, cooperation and support by others, rather than isolation and competition in learning.
- **Exams:** There are three exams. The exams will include problems and questions over material assigned in the text, readings and handouts, as well as material presented in class. If you do not take an exam you will receive a zero for it. Late exams may be taken only by prior arrangement with me or a well-documented emergency beyond your control. The examination schedule is included in the daily schedule. I do not intend to accept excuses such as poor communication with parents, benefactors, sport team sponsors and/or travel agents.
- **Final Exam:** The final is **comprehensive** and is on Wednesday, December 2 7:30 to 10:00 a.m. 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.

| Grading Distribution           | Percent |
|--------------------------------|---------|
| Three Examinations at 15% each | 45      |
| Final Exam                     | 25      |

|                    |     |
|--------------------|-----|
| Homework           | 15  |
| Quizzes            | 10  |
| Collaborative Work | 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 Exam 1, Exam 2, Exam 3 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    |      |

## 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](#) 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.

## 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](#) 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 (synchronous Zoom 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](#) 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](#)

Calendar:

| week             | Monday  | <b>Due before Wednesday:</b><br>Watch videos & read & do corresponding quizzes | Wednesday (50 min)                                      | <b>Due before Friday:</b><br>Watch videos & read & do corresponding quizzes | Friday (50 min)  |
|------------------|---|--|---|---|--|
| 1<br>8/17-8/21   | Zoom discussion-<br>Introduction to class<br>(20 min or less) | 12.1   | Zoom session: (40 min)<br>12.1<br>Introduce: 12.2, 12.3 | 12.2, 12.3  | Zoom session (40 min)<br>12.2 & 12.3<br>Introduce 12.4, 12.5 |
| 2<br>8/24 – 8/28 | Optional Lab on Zoom  | 12.4, 12.5<br><b>HW #1</b>   | Zoom session:<br>12.4, 12.5<br>Introduce 12.6           | 12.6  | Zoom Session:<br>12.6<br>Introduce: 13.1, 13.2               |
| 3<br>8/31-9/4    | Optional Lab on Zoom  | 13.1, 13.2<br><b>HW #2</b>   | Zoom session:<br>13.1, 13.2<br>Introduce 13.3, 13.4     | 13.3, 13.4  | Zoom Session:<br>13.3, 13.4<br>Prep for Exam #1              |
| 4<br>9/7-9/11    | Optional Lab on Zoom  | Prep<br><b>HW #3</b>   | Zoom Session:<br>Review for Exam #1                     |   | <b>Exam #1</b><br>(65 min.)                                  |
| 5<br>9/14-9/18   | Optional Lab on Zoom  | 14.1, 14.3   | Zoom Session:<br>14.1, 14.3<br>Introduce 14.5           | 14.5  | Zoom Session:<br>14.5<br>Introduce 14.6, 14.7                |
| 6<br>9/21-9/25   | Optional Lab on Zoom  | 14.6, 14.7<br><b>HW #4</b>   | Zoom Session:<br>14.6, 14.7<br>Introduce 14.8           | 14.8  | Zoom Session:<br>14.8<br>Introduce 15.1, 15.2                |
| 7<br>9/28-10/2   | Optional Lab on Zoom  | 15.1, 15.2<br><b>HW #5</b>   | Zoom Session:<br>15.1, 15.2<br>Introduce 15.3           | 15.3  | Zoom Session:<br>15.3<br>Prep for Exam #2                    |
| 8<br>10/5-10/9   | Optional Lab on Zoom  | Prep<br><b>HW #6</b>   | Zoom Session:<br>Review for Exam #2                     |   | <b>Exam #2</b><br>(65 min.)                                  |
| 9<br>10/12-10/16 | Optional Lab on Zoom  | 15.4, 15.5   | Zoom Session:<br>15.4, 15.5<br>Introduce 15.6           | 15.6  | Zoom Session:<br>15.6<br>Introduce 15.7, 15.8                |
| 10               | Optional Lab on Zoom  | 15.7, 15.8   | Zoom Session:<br>15.7, 15.8                             | 16.1  | Zoom Session: 16.1<br>Introduce 16.2, 16.3                   |

|                   |                                   |                                  |   |                  |   |
|-------------------|-----------------------------------|----------------------------------|---|------------------|---|
| 10/19-10/23       |                                   | <b>HW #7</b>                     | Introduce 16.1                                  |                  |   |
| 11<br>10/26-10/30 | Optional Lab on Zoom              | 16.2, 16.3<br><b>HW #8</b>       | Zoom Session:<br>16.2, 16.3<br>Prep for Exam #3 | Prep for Exam #3 | Zoom Session:<br>Review for Exam #3                 |
| 12<br>11/2-11/6   | Optional Lab on Zoom              | Prep for Exam #3<br><b>HW #9</b> | <b>Exam #3</b><br>(65 min.)                     | 16.4, 16.5       | Zoom Session:<br>16.4, 16.5<br>Introduce 16.6, 16.7 |
| 13<br>11/9-11/13  | Optional Lab on Zoom              | 16.6,16.7<br><b>HW #10</b>       | Zoom Session:<br>16.6, 16.7<br>Introduce 16.8   | 16.8             | Zoom Session:<br>16.8<br>Introduce 16.9             |
| 14<br>11/16-11/20 | Optional Lab on Zoom              | 16.9<br><b>HW #11</b>            | Zoom Session:<br>16.9<br>Prep for final exam    | Prep for final   | Zoom Session:<br>Review for final                   |
| 15<br>11/23-11/27 | Zoom Session:<br>Review for final | <b>HW #12</b>                    | No class<br>Thanksgiving                        |                  |   |
| 16<br>11/30-12/4  | Finals Week                       |                                  | Final Exam<br>7:30-10:00 am                     |                  |   |