# MATH 1510 M01 – Calculus I
# Spring 2018

## Course Information

Course title:        Calculus I
Course Number:       MATH 1510 M01
Prerequisite(s):     A grade of C- or better in MATH-1400 (or equivalent)
Credits:             4
Meeting Times:       MTWF 13:00-13:50

## Instructor Information

Name:            Marta Moreno
Email:           marta.moreno@slu.edu
Office hours:    M,T,W,F 14:15 - 16:00 and by appointment
Office:          Padre Arrupe Hall, Attic.

## Course Description

Limits. The derivative function. Using the derivative: Application to physics, geometry and economics. Differentiability. The Chain Rule. Optimization. Introduction to Modeling. The definite integral as area and average. The Fundamental Theorem of Calculus. Partial derivatives.

## Course Objectives

There are three main objectives of this first calculus course:
　　i. To provide students with a genuine understanding of the derivative and its applications beyond the purely symbolic level.
　　ii. To serve as an introduction to optimization and modelling.
　　iii. To strengthen an understanding of the concepts and principles through a broad range of applications to the real world.

This course is appropriate for students majoring in engineering.

## Learning Objectives

On successful completion of the course the student will have the following abilities:

- Students will understand properties of elementary functions
- Students will be able to find limits.
- Students will understand the concepts of continuity and differentiability
- Students will be able to symbolically compute derivatives.
- Students will be able to find derivatives graphically and numerically.
- Students will be able to solve optimization problems
- Students will be able to solve related rates problems
- Students will understand local linearity
- Students will understand the geometric interpretation of the integral
- Students will understand Riemann Sums.
- Students will be able to integrate basic functions.
- Students will be able to use the fundamental theorem of calculus.
- Students will be prepared for Calculus II

## Text books

Required reading: *Calculus, Early Trascendentals, Single Variable*, Howard Anton, Irl Bivens, Stephen Davis. Ed: Wiley. ISBN: 978-0-471-48238-3.

You can buy an electronic copy from Wiley at

https://www.wiley.com/en-es/Calculus+Early+Transcendentals%2C+10th+Edition+International+Student+Version-p-9781118379424

Recommended: *Student Solutions Manual to accompany Calculus Late Transcendentals Single Variable (Paperback),* Howard Anton, Irl Bivens, Stephen Davis. Ed: Wiley.

## Grading system:

Exams: There will be two midterm exams during the semester and a final examination in May, this will be cumulative with an emphasis on the material learned during the last third of the course. To pass this course it is necessary to have an average of 50 on these exams.

Quizzes: At the end of each Wednesday class we will have a brief 10 minute quiz. The quiz will test subject matter learnt the previous week. In total this accounts for 15% of your final grade, which makes each quiz worth approximately 1% of your final grade. I will drop your lowest two scores. The quizzes are not meant to be tricky or overly difficult, but to ensure that you are up to date on the course material and allow me to gauge this. There will be no make-up quizzes.

There will be weekly assignments from the book and from an online platform.

Grade Breakdown
- 10% assignments
- 15% quizzes
- 20/25% first midterm*
- 20/25% second midterm*
- 30% final exam

*The lowest of the two grades will be assigned 20%, the other 25%

Grading Scale

| | | | |
|---|---|---|---|
| 0-54.9 | F | 75-79.9 | B- |
| 55-59.9 | D | 80-84.9 | B |
| 60-64.9 | C- | 85-89.9 | B+ |
| 65-69.9 | C | 90-94.9 | A- |
| 70-74.9 | C+ | 95-100 | A |

## Attendance:

Attendance to MATH 1510 is mandatory, attendance and participation are a very important part of the learning process; missing classes will have a negative impact on your final grade. On the other hand, you will be responsible for any announcements, information, problems or course changes that are made in all lectures.

## Missed Exams Policy:

Midterm and final examinations must be written on their respective dates. No alternative examinations will be scheduled except in the case of excused medical absences. Cases of excused medical absences must be petitioned for through the Chair of the department. Make-up midterms are subject to approval by the professor, the Chair and the Division of Mathematics. All changes to the final examination must be approved by the Academic Dean.

**Important Dates:**

Jan.21 – Last day to drop a class without a grade of W or to add a class.
          Last day to choose audit (AU) or pass/no pass (P/NP) options.
Feb.9 – First Midterm exam, 14:00.
Mar.9 – Last day to drop a class and receive a grade of W.
Mar.16 – Second Midterm exam, 14:00.
Apr.4 – Registration for spring semester opens.
Apr.30 – Last day of class for MTWF classes.
May.7 – Final Exam, 12:00.


For other important dates, visit
 http://www.slu.edu/madrid/academics/registrar/academic-calendar/spring-2018


**COURSE OUTLINE**

Introduction and Review.

1. Limits.

2. Continuity.

3. The derivative.

4. Derivative rules.

5. Implicit differentiation.

6. Related Rates.

7. L'Hôpital's rule.

8. Applications of the Derivative: Increasing/Decreasing functions.

9. The second Derivative: Concavity.

10. Relative Minima and Maxima.

11. Absolute Minima and Maxima.

12. Optimization.

13. The indefinite integral.

14. The definite integral. Areas.

15. The Fundamental Theorem of Calculus.

16. Area between two curves

**Things that you should do in order to get a good grade in this class:**

- Don't miss classes, but if you ever have to miss one, ask one of your classmates (not me) for the notes as soon as possible and go over them before the next lecture.

- Do ALL the assigned exercises. I can't emphasize this enough. All quantitative classes require practice and this is not an exception.

- Read the chapter of the material before the lectures. You will probably don't understand everything, but the class will be much clearer if you do.

- Work every week, if possible, every day. If you don't have an assignment or exercises to practice (that would be very rarely), review your class notes and go over the problems we have solved in class on your own one more time.

- Feel free to pass by my office to ask me if something is not clear from the lecture before the next lecture, you will probably have trouble understanding this otherwise.

- If you haven't been able to reach me in my office hours, e-mail me your question, try to make it clear and concrete, but do not hesitate to send it to me. If the question is complicated and requires a long explanation, better wait until the next day I have office hours or try to make an appointment if you can't wait.

- Form study groups and make sure that all members participate and learn from each other. Experience shows that this kind of class is more effectively learned when you work in groups.

- Remember my office hours!!

- Remember and follow at least six of these recommendations.


**Things that you shouldn't do in this class:**

- Be late to the lectures, it is very disruptive to the other students and very disrespectful. Also, you miss the most important part of the lecture, where I say what we are going to do and sometimes do a short review of what we did in the previous class.

- Use your phone during the lectures, whether it is for texting or using internet or, obviously, talking, it is extremely disrespectful. I will not allow it.

- Come to my office hours before you have tried to understand the material on your own going over the chapter from the textbook and doing a few exercises.

- Think that by just coming to class, you have all the work done. If you don't practice, you will not learn the material.

- Try to study everything two days before the test. It is impossible to really understand this topic by rushing over the material in a few hours.

- Skip homework and/or quizzes.

- Copy the homework from someone else. Not only it will be considered a violation of the academic honesty code, but it is completely useless. The only purpose of the homework is to help you learn.

## Academic Honesty Policy Statement:

*Academic integrity is honest, truthful and responsible conduct in all academic endeavors*. The mission of Saint Louis University is "the pursuit of truth for the greater glory of God and for the service of humanity." Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care and community service via which SLU embodies its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern.

The governing University-level Academic Integrity Policy can be accessed on the Provost's Office website at: http://www.slu.edu/Documents/provost/academic_affairs/University-wide%20Academic%20Integrity%20Policy%20FINAL%20%206-26-15.pdf.

As a member of the University community, you are expected to know and abide by these policies, which detail definitions of violations, processes for reporting violations, sanctions and appeals.

## Accommodation Statement

In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. Students who think they might benefit from these resources can find out more about:

- Course-level support (e.g., faculty member, departmental resources, etc.) by asking your course instructor.
- University-level support (e.g., tutoring/writing services, Disability Services) by visiting the Academic Dean's Office (San Ignacio Hall) or by going to http://spain.slu.edu/academics/learning_resources.html.

Students with a documented disability who wish to request academic accommodations **must** contact Disability Services to discuss accommodation requests and eligibility requirements. Once successfully registered, the student also must notify the course instructor that they wish to access accommodations in the course. Please contact Disability Services at disabilityservices-madrid@slu.edu or +915 54 58 58, ext. 230 for an appointment. Confidentiality will be observed in all inquiries. Once approved, information about the student's eligibility for academic accommodations will be shared with course instructors via email from Disability Services. For more information about academic accommodations, see "Student Resources" on the SLU-Madrid webpage.

Note: Students who do not have a documented disability but who think they may have one are encouraged to contact Disability Services.

## Student Outcome Assessment:

In order to maintain quality academic offerings and to conform to accreditation requirements, SLU-Madrid regularly assesses its teaching, services and programs for evidence of student learning. For this purpose, SLU-Madrid keeps representative examples of student work from all courses and programs on file, including assignments, papers, exams, portfolios and results from student surveys, focus groups and reflective exercises. Copies of your work for this course may be kept on file for institutional research, assessment and accreditation purposes. If you prefer SLU-Madrid not to retain your work for this purpose, you must communicate this decision in writing to your professor.

## Title IX

Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU's Title IX deputy coordinator, Marta Maruri, whose office is located on the ground floor of Padre Rubio Hall, Avenida del Valle, 28 (mmaruri@slu.edu; 915-54-5858 ext. 213) and share the basic fact of your experience with her. The Title IX deputy coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

If you wish to speak with a confidential source, you may contact the counselors at the SLU-Madrid's Counseling Services on the third floor of San Ignacio Hall (counselingcenter-madrid@slu.edu; 915-54-5858 ext. 230) or Sinews Multipletherapy Institute, the off-campus provider of counseling services for SLU-Madrid (www.sinews.es; 91-700-1979) To view SLU-Madrid's sexual misconduct policy and for resources, please visit the following web address: http://www.slu.edu/Documents/Madrid/campus-life/SLUMadridSexualMisconductPolicy.pdf