

MATH 1522: Calculus II

Instructor

Dr. Ariel Ramirez

aramirez8@unm.edu

Office: LRC 172

Class Details

Tuesday/Thursday

Class Time: 1:30-3:20pm

Room: VAAS 124

MyMathLab Course ID:

ramirez17241

Office Hours

M/W 1:30-3pm (LRC)

T/Th 11:30am-1pm (LRC)

Or by Appointment



"Laboratory Still Life 02" - Don Shank

Contents

Course Description	1
Course Outcomes	1
Course Materials	1
Classroom Policies	2-3
Student Resources	3
University Policies	4-5
Grading	5
Outline/Outcomes	6-7

Course Description

This course covers transcendental functions, techniques of integration, numerical integration, improper integrals, sequences and series, Taylor series with application, complex variables, and differential equations. (4 Credit Hours).

Prerequisites: Math 1512. Check with your adviser to make sure you meet the requirements.



Course Outcomes

In this course, we will investigate sequences and series, and a variety of integration techniques used to solve applied problems. A complete list of the Student Learning Objectives for this course is given at the end of this syllabus.

Course Materials

Textbook:

Thomas' Calculus, 14th edition, by Hass, J., Heil, C., & Weir, M., Pearson Publishing.

Required: Appropriate MyMathLab (MML) access code (do not purchase a generic code, in this case the code is book specific). You may purchase the 18-week access code for a lower price, but you *cannot* upgrade to the lifetime code once you purchase the restricted one.

Optional: You may "upgrade" your access by purchasing a hardcopy of the book directly from Pearson for an additional cost (between \$50 and \$60 before tax). There will be copies of the book on reserve for use in the library (you will not be able to take the book from the library home).

Other Requirements:

- Reliable access to a computer or tablet, and Internet. A computer (laptop or desktop) is recommended. Preferred browsers are Chrome, Firefox, or Safari. Preferred operating systems are Windows or Apple.

Other Requirements (continued):

- Administrative rights to download free software or plug-ins or add-ons on the computer you plan to use for this course. The first time you login to the MyMathLab (MML) homepage run the Installation Wizard to make sure you have all the appropriate software installed. Also, make sure you are allowing popups.
- Pearson account. If you have used any of the Pearson My Lab products before, you can use the same account you created the first time you used it. Otherwise, you can create an account when you register in MyMathLab (MML) for this class. Register by going to mymathlab.com.
- Access to UNM Learn. will use your UNM NetID to log into UNM Learn. You may access it directly via learn.unm.edu
- Standard or Scientific calculator. This cannot be an app on your cell phone.
- Adobe Reader (a free download), preferably version 11.0 or better.

Classroom Policies

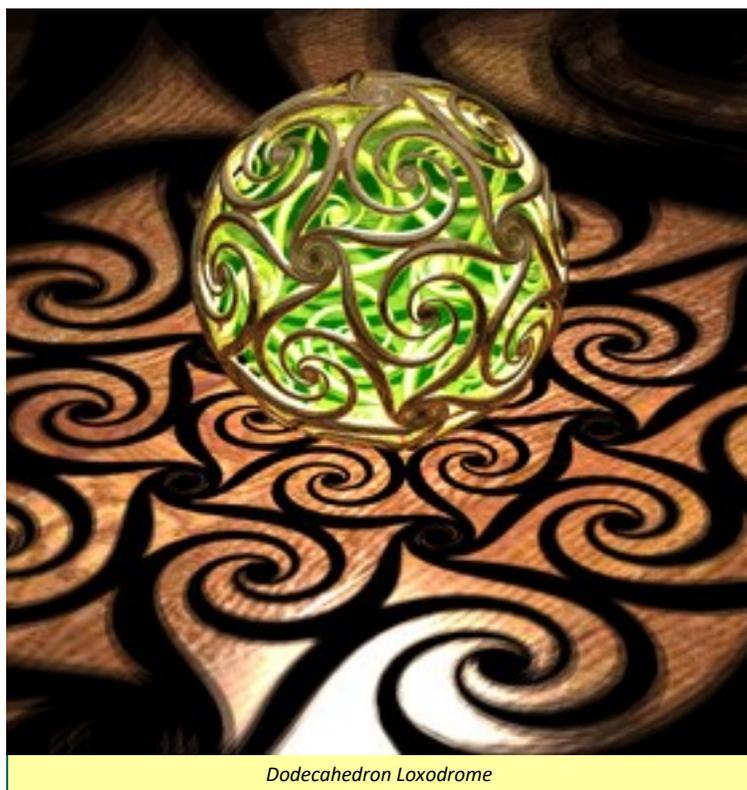
Attendance / Participation (100 points)

You are expected to be on time to each class and stay the entire class, have the necessary course materials on hand, and participate in the lecture and/or group activities to receive full credit for attendance each day.

Absences: If you know ahead of time you will miss a class, send me an email indicating the date of the absence.

Arrange before the next class meeting to get notes from a classmate. The student bears full responsibility for the material and information covered in class.

Each student starts with 100 attendance points. Attendance is taken at the **beginning** of class.



Dodecahedron Loxodrome

Homework (260 points)

Homework is assigned nearly every week based on the course outline. Weekly assignments in MyMathLab must be completed not later than the indicated date in MML. **Each homework assignment is worth 24 points.** The lowest homework grade will be dropped. A 10% penalty may be incurred if your homework is late. You will not be able to go back to improve your grade after the due date.

Quiz (100 points)

We will have 9 quizzes in class for 12.5 points each. The lowest grade on a quiz will be dropped. Each quiz will have a few problems from the online homework. The quizzes will resemble the exam and final exam, so you should use them to study.

Classroom Policies



Gottfried Wilhelm Leibniz,

(June 21, 1646—November 14, 1716), German philosopher, mathematician, and political adviser, important both as a metaphysician and as a logician and distinguished also for his independent invention of the differential and integral calculus.

In-Class Group Assignments (40 points)

- During the semester, we will have several in-class assignments. You will work in groups.
- Groups will be between two and three students.
- These assignments will further develop your conceptual understanding of the topics presented in the course.
- **You must be present to participate and receive any credit.**
- Each in-class assignment is worth 10 points. Each group member receives the same grade.

Exams (200 points)

There will be two exams during the semester based on the quizzes and homework in the course. Each is worth 100 points. If you are ill or an unexpected event happens, and you cannot make it to the exam, you have one week to make it up.

Final Exam (300 points)

The final exam will cover all the topics in the course. It will be based on the exams, quizzes, and homework.

EXPECTATIONS: Students are expected to conduct themselves in a polite, courteous, professional and collegial manner. **Cell phones must be set on silent and be out of sight during class. No food or drink is allowed in the computer labs.**

Time for This Course: Plan to spend a *minimum* of 9 to 12 hours per week for this class. There is no guarantee you will pass if you dedicate this amount of time, you still need to learn the material and use your time wisely, but those who pass generally are the ones who spend the time needed to learn the material.

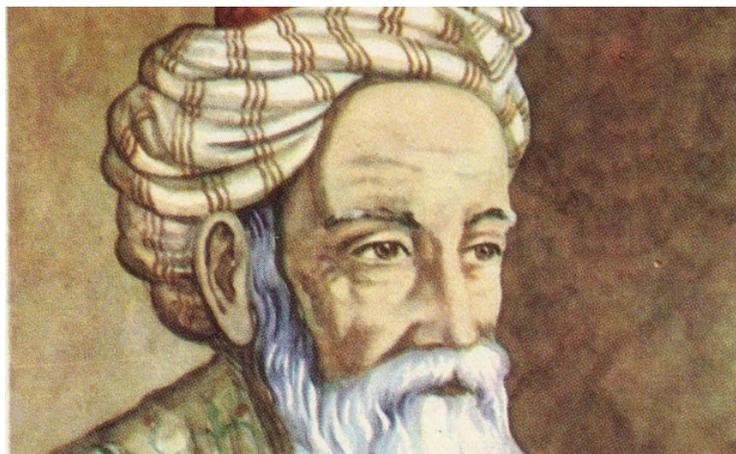
Student Resources: If you are struggling in this course, do not be afraid to ask for help!

- Ask My Instructor: Please use the Ask My Instructor button in MyMathLab. This button is available in the computational assignments and in the quizzes and sends a message to my email with a link to the question. Do not just send the link, tell me where in the problem you are struggling.
- Office Hours: See my office hours listed at the beginning of this syllabus.
- Form study groups: You may work together with other members of our class.
- Free Tutoring: The Math Center at Valencia campus has free tutoring and open labs. Call 505-925-8907 for more information.
- Student Services: There are various services provided in our Student Services Department. See below about equal access. Also, we have a testing center, advising, and career placement available: [Valencia Student Services](#)

University Policies

Equal Access: In accordance with University Policy 2310 and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as I am not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow. Contact Accessibility Resource Center at 277-3506 for additional information.

If you need an accommodation based on how course requirement interact with the impact of a disability, you should contact me to arrange an appointment as soon as possible. At the appointment we can discuss the course format and requirements, anticipate the need for adjustments and explore potential accommodations. I rely on the Disability Services Office for assistance in developing strategies and verifying accommodation needs. If you have not previously contacted them I encourage you to do so.



Omar Khayyam 1048-1131

Khayyam was an astronomer, astrologer, physician, philosopher, and mathematician. In 1070, he published *Treatise on Demonstration of Problems of Algebra and Balancing*. In it he showed that a cubic equation can have more than one solution. He also showed how the intersections of conic sections such as parabolas and circles can be utilized to yield geometric solutions of cubic equations.

www.famousscientists.org/omar-khayyam/.

If you are a Valencia campus student, contact Equal Access Services at Valencia Campus, Jeanne Lujan at (505)925-8910 or [Valencia Student Services](#). If you are a main campus student you can receive documentation from the main campus Accessibility Resource Center. I will not guarantee accommodation without the appropriate documentation.

Collegial Behavior: Since I assume you are all adults, I will expect respectful adult behavior. Engaging in disruptive or unruly behavior could result in your being asked to leave, at which time you will be counted absent and a referral will be sent to the Associate Dean of Student Services. Continuing to behave in this way could result in your being dropped from the course. Disruptive or unruly behavior includes but is not limited to:

- texting or talking on your cell phone at any time during class,
- continually talking with your neighbor when we are not working on a group activity,
- working on homework from another class,
- reading material or watching media on a mobile device not related to this course or at a time that is inappropriate,
- refusing to participate in the class activities.

Academic Integrity

Having academic integrity is paramount to your success in any class. Plagiarism or cheating is not tolerated. Any instance of this will result in a grade of zero for that assignment. Here is the link to the UNM Academic Dishonesty Policy: <https://policy.unm.edu/regents-policies/section-4/4-8.html>.

The policy states:

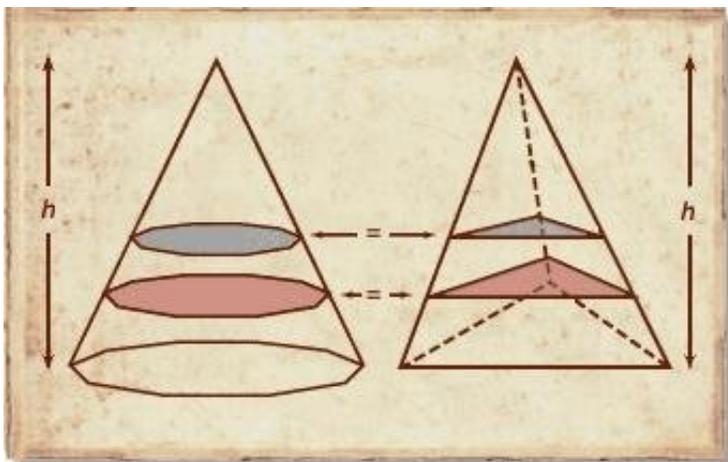
Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or who otherwise fails to meet the expected standards.

University Policies (continued)

Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.

Academic Dishonesty is defined as:

"Academic dishonesty" includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.



© 2000 Encyclopædia Britannica, Inc.

Cavalieri's Principle

Bonaventura Cavalieri, (1598 — 1647) Italian mathematician who made developments in geometry that were precursors to integral calculus. Cavalieri observed that figures (solids) of equal height and in which all corresponding cross sections match in length (area) are of equal area (volume).

Title IX Statement: In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees" by the Department of Education (see pg. 15 - <http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf>). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: <https://policy.unm.edu/university-policies/2000/2740.html>

Grading

COURSE AVERAGES:

Attendance/Class Participation	100 points
MyMathLab Online Homework	260 points
Quizzes	100 points
In-Class Group Assignments	40 points
Term Exam (two, 100 points each)	200 points
Cumulative Final Exam	300 points
Total	1000 points

GRADING SCALE:

<u>Letter Grade</u>	<u>Weighted Average</u>
A	[90, 100]
B	[80, 90)
C	[70, 80)
D	[60, 70)
F	[0, 60)

Week	Dates	Sections / Topics	Assignments
1	1/21-1/23 T/Th	Introduction Sec. 7.1, 7.2	
2	1/28-1/30 T/Th	Sec. 7.3, 7.4	MML homework 1 due Quiz #1
	1/31	Last day to add a course (5pm)	
3	2/4-2/6 T/Th	Sec. 7.5, 7.6	MML homework 2 due Quiz #2
	2/7	Last day to drop a course without a grade (5pm)	
4	2/11-2/13 T/Th	Sec. 7.7, 8.2	MML homework 3 due Quiz #3
5	2/18-2/20 T/Th	Review Exam #1	MML homework 4 due
6	2/25-9/27 T/Th	Sec. 8.2, 8.4	
7	3/3-3/5 T/Th	Sec. 8.5, 8.6	MML homework 5 due Quiz #4
8	3/10-3/12 T/Th	Sec. 8.7, 8.8	MML homework 6 due Quiz #5
3/15 - 3/22 Spring Break			
9	3/24-3/26 T/Th	Sec. 9.1, 9.2	MML homework 7 due Quiz #6
10	3/31-4/2 T/Th	Review Exam #2	MML homework 8 due
11	4/7-4/9 T/Th	Sec. 10.1, 10.2	
12	4/14-4/16 T/Th	Sec. 10.3, 10.4	MML homework 9 due Quiz #7
	4/17	Last day to drop without Dean's Permission (5pm)	
13	4/21-4/23 T/Th	Sec. 10.5, 10.6	MML homework 10 due Quiz #8
14	4/28-4/30 T/Th	Sec. 10.7, 10.8, 10.10	MML homework 11 due Quiz #9
15	5/5-5/7 T/Th	Review	MML homework 12 due
	5/8	Last day to drop with Dean's permission/change grade mode with form (5pm)	
16	5/11	Final Exam Week	

Course Student Learning Outcomes

Upon successful completion of the course, students will be able to:

- A. Know the definitions, graphs, special values, derivatives and integrals (when possible) of transcendental functions, including exponential, logarithmic, inverse trigonometric and hyperbolic functions.
- B. Use the methods of substitution, integration by parts, partial fractions and trigonometric substitution to compute proper and improper integrals. Evaluate improper integrals using correct mathematical limit notation.
- C. Use rectangles or trapezoids to approximate integrals. Explain the difference between a first order and a second order approximation method.
- D. Solve separable differential equations. Plot direction fields and solution curves. Find equilibrium solutions.
- E. State the definition of the value of a series, as well as necessary conditions for convergence. Use the definition to determine the value of a series. Determine the value of known Taylor series at particular points. State various tests for convergence, including all conditions, and apply them. Approximate alternating series and estimate the error.
- F. Determine the asymptotic behavior of functions $f(x)$ as $x \rightarrow \pm\infty$, and the limit of indeterminate forms.
- G. State the definition of the Taylor series of a function and describe its properties. Find Taylor series using the definition, or by substitution into, or differentiation or integration of known series, and determine their interval/radius of convergence. Approximate functions by Taylor polynomials within the domain of convergence and estimate the error. Include approximations of definite integrals or quantities depending on parameters, such as arise in applications in physics, biology and engineering.
- H. Use Taylor series to derive Euler's formula for the exponential of a complex number. Evaluate sums, products, powers, roots, and exponentials of complex numbers. Evaluate integrals of complex functions.