Math 1522: Calculus 2
T/TR, 3:00pm-4:45pm
A-127

Instructor: Andy Taylor

Contents

1 Office and Contact Information:

Office: A-123B
Office Phone: 505-925-8607
Email: ataylor19@unm.edu

Please note that email is the best way to contact me. If you send a message/question via WebAssign or Canvas, and I don't reply promptly, please let me know via email!

2 Office Hours:

Mon/Wed: Valencia Workforce Training Center Lobby/Library, 1:15pm-2:30pm
Tues/Thurs: Learning Center/Math Center, Valencia Campus, 1:30pm-2:45pm
OR BY APPOINTMENT

Please plan to regularly check into my office hours (tutoring hours). The purpose of this is to increase your accountability for the course, and for me to give you more immediate feedback on questions you may have, as well as your current status in the course. Also, the secret phrase is *'I can do this'*.

3 Overview

Welcome to Math 1522! Here is the UNM course description:

> Transcendental functions, techniques of integration, numerical integration, improper integrals, sequences and series, Taylor series with applications, complex variables, differential equations. (I)
>
> Credit for both this course and MATH 1440 may not be applied toward a degree program.
>
> Meets New Mexico General Education Curriculum Area 2: Mathematics and Statistics.
>
> **Prerequisites/placement**: Prerequisite: Math 1512.

Please note: This syllabus is subject to change, if needed.

4 Student Learning Outcomes (SLOs)

At the completion of this course students will be able to:

1. **Logarithmic, Exponential, and Other Transcendental Functions**
   (a) Demonstrate that a function is monotonic, therefore 1-1, showing it is invertible. Then they'll be able to find the explicit inverse of another function, as well as understand the relationship between tangent slopes on a function and its inverse.
   (b) Analyze, differentiate and integrate logarithmic and exponential functions with various bases.
   (c) Produce formulas for derivatives of inverse trigonometric functions, as well as recognize them in the context of an integration problem.
   (d) Recognize limits in indeterminate forms and utilize L'H*ô*pital's Rule in order to evaluate such limits.
   (e) Explore the relationship between exponential and hyperbolic-trigonometric functions and their applications in certain engineering contexts.
2. **Integration Techniques**
   (a) Evaluate antiderivatives of functions using an appropriate substitution, including trigonometric substitutions.
   (b) Re-express trigonometric integrands involving products of secants and tangents or sines and cosines with various exponents in order to reveal an appropriate substitution.
   (c) Decompose a rational function into partial fractions in order to more readily integrate.
   (d) Approximate values of definite integrals using Midpoint Rule, Trapezoid Rule, and Simpson's Rule; students will also be able to evaluate the error in their approximations and determine an upper bound for the error based upon the method and number of sub-intervals used for the approximation.
   (e) Recognize an improper integral and evaluate for convergence/divergence using limits.
3. **Differential Equations**
   (a) Recognize and solve separable differential equations for general solutions, as well as particular solutions with a given initial condition.
   (b) Interpret and find solutions for natural growth/decay models, as well as the logistic growth model.
   (c) Solve various first order differential equations using various integration methods.
   (d) Graph slope fields for the general solution of a differential equation using the equation itself, as well as by using its graph (t vs. $\frac{dy}{dt}$).
   (e) Approximate solutions to differential equations using Euler's Method.
4. **Infinite Series**
   (a) Write terms of a sequence, as well as determine formulas for the nth term in a sequence and graph the terms of that sequence.
   (b) Determine whether a sequence converges or diverges based on monotonicity and boundedness.
   (c) Understand the definition of a convergent/divergent infinite series.

(d) Utilize the nth term test for divergence to determine whether or not series diverges.

(e) Recognize geometric series and p-series and determine convergence/divergence.

(f) Analyze convergence/divergence of series using Integral/Comparison/Limit-Comparison/Root/Ratio tests.

(g) Find power series representations of functions, Taylor/Maclaurin series representations for functions and determine radius of convergence.

5. **Complex Numbers**

   (a) Use Euler's formula to explore $e^{i\theta}$, graph complex numbers, determine modulus.

   (b) Evaluate basic complex-valued integrals and recognize real and imaginary part.

5 Technical Requirements

5.1 Computer

- A high-speed Internet connection is highly recommended.
- Supported browsers include: *Detailed Supported Browsers and Operating Systems*
- Any computer capable of running a recently updated web browser should be sufficient to access your online course. However, bear in mind that processor speed, amount of RAM and Internet connection speed can greatly affect performance. Be aware, some programs that use mathematics will not work well on mobile devices such as smart phones or tablets.
- Microsoft Office products are available free for all UNM students:
  UNM IT Software Distribution and Downloads page
- Please update your contact information in Loboweb: *MyUNM*. When you log into MyUNM, Enter LoboWeb. Click on the Personal Information link to make sure your contact information is up to date.
- Laptops may be available for checkout for the semester from the *UNM-Valencia Library* . Contact *UNM-Valencia Student Services* for more information.

5.2 Web Conferencing

Web conferencing may be used in this course for office hour appointments or study sessions. To participate, you will need:

- A USB headset with microphone is recommended. Headsets are widely available at stores that sell electronics, at the UNM Bookstore or online.
- A high-speed internet connection is highly recommended for these sessions. A wireless Internet connection may be used if successfully tested for audio quality prior to web conferencing.
- You should also dress as you would when attending an in-person class, even if you do not turn on your video camera.
- To create a UNM supported Zoom account, visit the *UNM Zoom log in page*.

6 Netiquette

NOTE: For links to online PDF formatted documents, you may need to give permission for the document to open. Look for a pop-up window asking for your permission.

One of the overriding principles in online conversations is to âcraft your responses effectively.â It is sometimes difficult to remember that there are real people reading posted messages. This is especially true of online communication where others do not have the opportunity to see body language or hear tone of voice; therefore, misunderstandings are more likely.

Please, follow these guidelines in all of your online responses and discussion postings:

- Honor everyone's right to an opinion.
- Respect the right of each person to disagree with others.
- Respond honestly but thoughtfully and respectfully; use language which others will not consider foul or abusive. You may also use emoticons to convey a lighter tone.
- Respect your own privacy and the privacy of others by not revealing information which you deem private and which you feel might embarrass you or others.
- Be prepared to clarify statements which might be misunderstood or misinterpreted by others.

6.1 A Special Note about Anger

- Do not send messages that you have written when you are angry, even anonymous ones. In the online world, angry messages are known as "flamingâ and are considered bad behavior. Venting and flaming are two different things. It is possible to vent without becoming "ugly."Stick to the facts of what is causing you frustration.
- Do not send messages that are written all in upper case; this is the visual equivalent of SHOUTING. It is considered aggressive and is considered bad behavior. If you ever feel like shouting a message, take a deep breath and wait until you have calmed down before responding. Then, respond in a calm and factual manner.
- For more information on netiquette, please refer to *UNM Netiquette document*.

7 Notes to students about participation in course using UNM Learn:

7.1 Tracking Course Activity

UNM Learn automatically records all studentsâ activities including: your first and last access to the course, the pages you have accessed, the number of discussion messages you have read and sent, web conferencing, discussion text, and posted discussion topics. This data can be accessed by the instructor to evaluate class participation and to identify students having difficulty.

7.2 Submitting Assignments

You will submit all written assignments (quiz/project/exam) in class by the due date. All assignments and work therein should be neat, legible, appropriately organized, and include detailed and well-justified work. Any work that is illegible, or that lacks proper substance/explanation/justification will not receive credit. Please make sure to show ALL your work so that partial credit can be awarded for simple mistakes. Remember, you can use words to explain your thinking alongside your mathematics.

8 Coursework and Participation

8.1 Communication with Instructor

I routinely check for student emails, Monday through Friday, at various times throughout the morning, afternoon and evening, as well as occasionally on weekends. Expect a response no later than 24-48 hours. If I haven't responded within 48 hours, please resend your email, as it may have (accidentally) been overlooked!

8.2 Late or Missing Work

- WebAssign Homework may be accepted late up to 4 times for the semester, for any reason. Please let me know at least in advance of the due date via UNM email if you have some extenuating circumstance limiting your ability to submit an assignment. **The quizzes, midterm and final exams must be submitted on time to receive credit**. Late project submissions will have a penalty of 10% per day, up to a week beyond the deadline. Any projects submitted beyond 1 week from the due date will not be accepted. The final (video) project must be submitted on time to facilitate the timely distribution of final grades. Quizzes/exams can ONLY be made up before-hand (prior to the rest of the class taking the quiz) except in a true emergency circumstance. Please notify me at least 48 hours ahead of the time you wish to make up a quiz/exam.

- All written work needs to be submitted online. If you have a difficulty using a tool to complete work, use the "Create a Tech Support Ticket" link in the Course Menu immediately and notify your instructor, as well.

- If you are ill and are not able to complete work on time, please let me know as soon as possible. I will work with you to shift deadlines but be aware that all assignments must be complete by the end of the semester. This may mean that when you are feeling better you will need to spend a lot of extra time to catch up. Also, if you are behind, the posted lectures or class session recordings may not be as helpful to your learning until you are ready to learn that material.

8.3 Expectations for Students

Please note that in order to be successful in this course, and in mathematics courses in general, you will need to spend a fair amount of time each week working on this course.

Here are my recommendations for the amount of time you should be spending in this course *each week*:

- Homework: 8-12 hours/week

- Office Hours: 30 min to 2 hours/week
- General Studying: 2-6 hours/week outside of homework and office hours

A more detailed schedule for assignments, projects, exams and their due dates can be found on Blackboard, and may be subject to change.

9 Required Text and Program

The required text (or eText) for this course is:

- *Calculus, 11th edition*, by Ron Larson and Bruce Edwards.
- Our course is integrated with RedShelf. Please visit the "RedShelf Course Materials" tab in Canvas to receive an access code for WebAssign, if you don't already have paid access. This will charge your Bursar's account for the product, and includes access to the WebAssign assignments, as well as a digital copy of the textbook. Register for our class using our class key (this is not an access code, it simply identifies the course you should register for):
  unm 1016 0696.

  If you are unsure how to gain access, please refer to the instructions below.

9.1 Instructions for Registering a WebAssign Account

- *Here* is a link to instructions on how to register for our WebAssign course.
- **Need assistance?** The Cengage technical support team can be reached via their *website* or by phone at (800) 354-9706.

10 Attendance Policy

Attendance in the course is **required**. If a student misses two or more classes in the first two weeks of the semester, three consecutive class periods or five total, I reserve the right (but not the obligation) to drop the student from the class. If you stop attending class for any reason, it is your responsibility to make sure you drop the class, or risk getting a failing grade. If you have extenuating circumstances that prevent you from being in class regularly, please contact me so we can discuss this within the first two weeks of the semester.

11 Course Structure

This course will consist of the following graded components:

- Homework (20%)
  - Expect 2 homework assignments per week (most weeks, 1 per section), to be completed via WebAssign.

- Quizzes (10%)
  - Expect a (roughly) weekly quiz where your handwritten work will be submitted in class.
- Projects (30%)
  - You will complete 2 projects during this course.
  - Each project will count for 15% of your final grade. You will submit the first project as a report in class, and the second will be uploaded into a Canvas dropbox.
- Midterm Exam (15%)
  - The midterm exam will be given Tuesday, October 11, 2022.
  - You will complete and submit this exam in class.
- Final Exam (25%)
  - The comprehensive final exam will be held on Tuesday, December 13, 2022 from 12pm-2pm.
  - You will complete and submit this exam in class.

For written assessment submissions such as quizzes, exams, and projects you should *generally* expect your grades within 1 week. Assignments through WebAssign offer immediate grading upon submission.

12 A Note About Plagiarism/Cheating

Cheating is any behavior that short circuits your learning. This can range from mindlessly mimicking what you see in the readings or examples, to simply copying someone else's solution, to paying someone to complete the assignment or course for you. **The use of any program or app like Chegg, Wolfram Alpha, PhotoMath and others on your computer or phone to copy down solutions for homework, quiz, or exam questions constitutes plagiarism**. ***The penalties for plagiarism may include being given a '0' on the plagiarized assignment/exam, which could result in a significantly lowered/failing grade in the course.*** If you ask for help from someone other than the instructor or a tutor and then just copy down what they tell you, that is also cheating. In all of your assignments you should demonstrate what you understand. If you do not understand, ask for help from your instructor!

13 Grading Policy

Please note: Your average listed in the 'My Grades' section in BB Learn may not include the final homework average until the end of the semester; your homework grade will be computed in WebAssign (dropping the two lowest scores) and weighted into the final average at the end of the course. Grades for all written assignments can be found in the 'My Grades' section in Blackboard Learn throughout the semester.

Final grades will be assigned as shown below:

Cumulative Average	Final Grade
[96.5%, 100%]	A+
[93%, 96.5%)	A
[89.5%, 93%)	A-
[86.5%, 89.5%)	B+
[83%, 86.5%)	B
[79.5%, 83%)	B-
[76.5%, 79.5%)	C+
[69.5%, 76.5%)	C
[66.5%, 69.5%)	D+
[59.5%, 66.5%)	D
[0%, 59.5%)	F

14 Semester Deadlines

Fall 2021: 16-week classes (Full term)

- **Monday, August 22nd**: First day of class, classes available in Canvas
- **Friday, September 2nd, by 5:00 PM**: Last day to add a class or to change credit hours or grade mode in LoboWEB.
- **Monday, September 5th** Labor Day: No class.

- **Friday, September 9th, 5:00pm**: Last day to drop without "W" grade and with 100% refund on LoboWEB
- **October 13th and 14th**: FALL BREAK: No class.
- **Friday, November 11th**: Last day to drop without Dean's permission on LoboWEB. Will receive "W" grade and will be responsible for tuition for the course.
- **November 24th and 25th** Thanksgiving break: No class.
- **Friday, December 9th**: Last day to drop with Dean's permission. Will receive "W" grade and will be responsible for tuition for the course.
- **December 12th - 16th**: Finals week.

15 UNM Policies

15.1 EQUAL OPPORTUNITY AND NON-DISCRIMINATION:

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 page 15 of this link). 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*.

15.2 Copyright

All materials in this course fall under copyright laws and should not be downloaded, distributed, or used by students for any purpose outside this course. The *UNM Copyright Guide* has additional helpful information on this topic.

15.3 Accessibility and Accommodations

The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodations of their disabilities. If you have a disability requiring accommodation, please contact:

- *UNM-Valencia Student Services* if you are a Valencia campus student. The phone number is 505-925-8560.
- The *UNM Accessibility Resource Center* in 2021 Mesa Vista Hall if you are a main campus student. The phone number is 505-277-3506.

15.4 Academic Integrity

You should be familiar with *UNM's Policy on Academic Dishonesty* and the *Student Code of Conduct* which outline academic misconduct defined as plagiarism, cheating, fabrication, or facilitating any such act.

16 UNM Resources

- *UNM Valencia Campus Tutoring Services*
- *UNM Main Campus CAPS Tutoring Services*
- *UNM-Valencia Library*
- *UNM Libraries*
- *"Life" Resources available to UNM-Valencia Students*
- *Student Health Counseling (SHAC) Online Services*

17 General Education Core Curriculum Essential Skills

In addition to the course learning objectives listed above, because this class meets a UNM General Education Core Curriculum requirement, activities in each unit (i.e.: discussions, assignments, and assessments) are developed so that you can demonstrate development of these essential skills:

17.1 Critical Thinking

- Problem Setting: Delineate a problem or question to be considered critically.
- Evidence Acquisition: Identify and gather the information/data necessary to coherently address the problem or question.
- Evidence Evaluation: Evaluate the information given by sources for credibility (e.g. bias, reliability, validity) and probably truth.
- Reasoning/Conclusion: Develop conclusions and outcomes that reflect an informed, well-reasoned argument.

17.2 Communication

- Genre and Disciplinary Conventions: Use formal and informal rules/registers appropriate for the particular audience, community, purpose, context, and kind of text and/or media at hand; use them to guide formatting, organization, and stylistic choices are present.

- Strategies for Understanding and Evaluating Messages: Apply strategies such as reading/analyzing for main points or themes; recognizing the variety of rhetorical situations and accompanying strategies that may contextualize messages; locating supportive documentation for arguments to understand and evaluate messages in terms of the rhetorical situation.
- Evaluation and Production of Arguments: Recognize and evaluate the authority of sources in their own arguments and those of others; distinguish among supported claims, unsupported claims, facts, inferences, and opinions.

17.3 Quantitative Reasoning

- Communication and/or Representation of Quantitative Information: Express quantitative information symbolically, graphically, and in written or oral language
- Analysis of Quantitative Arguments: Interpret, analyze and critique information or a line of reasoning presented by others
- Application of Quantitative Models: Apply appropriate quantitative models to real-world or other contextual problems

18 Citizenship And/Or Immigration Status

All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related absences are normally excused with reasonable notice to the professor. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The Administration's welcome is found on our website: http://undocumented.unm.edu