Math 1512: Calculus 1 (SU24)
MTWR, 3pm-4:45pm
Remote-Scheduled Course

Instructor: Andy Taylor: ataylor19@unm.edu
MECS Division Chair: Ariel Ramirez: aramirez8@unm.edu

Contents

1   Office and Contact Information:

Office: A-123B
Email: ataylor19@unm.edu

Please note that email is the best way to contact me. Office/tutoring hours will be held virtually through Zoom.

2   Office Hours:

These will be held via Zoom in the following Zoom Room: *https://unm.zoom.us/j/98190874379*

Office hours will be accessible during these times:

Monday/Wednesday 1:30pm-3:00pm, or by appointment

Please plan to regularly check into my office hours (instructor-led help sessions). 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. Students should be aware that the secret phrase is *'I can do this'*.

3   Overview

Welcome to Math 1512! Here is the UNM course description:

> Limits. Continuity. Derivative: definition, rules, geometric interpretation and as rate-of-change, applications to graphing, linearization and optimization. Integral: definition, fundamental theorem of calculus, substitution, applications such as areas, volumes, work, averages. (I)
>
> Credit for both this course and MATH 1430 may not be applied toward a degree program.
>
> Meets New Mexico General Education Curriculum Area 2: Mathematics and Statistics.
>
> **Prerequisites/placement**: Prerequisite: (1230 and 1240) or 1250 or ACT Math =>28 or SAT Math Section =>640 or ACCUPLACER Next-Generation Advanced Algebra and Functions =>284.

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. *Limits and Continuity*

   (a) Estimate a limit using a numerical or graphical approach.
   (b) Evaluate a limit using properties of limits, the dividing out technique, the rationalizing technique and the Squeeze Theorem.
   (c) Determine continuity at a point and continuity on an open interval.
   (d) Determine one-sided limits and continuity on a closed interval.
   (e) Use properties of continuity.
   (f) Understand and use the Intermediate Value Theorem.
   (g) Determine infinite limits from the left and right.
   (h) Find and sketch vertical asymptotes of the graph of a function.

2. *Differentiation*

   (a) Find the slope of the tangent line to a curve at a point.
   (b) Use the limit definition to find the derivative of a function.
   (c) Understand the relationship between differentiability and continuity.
   (d) Find the derivative of a function using the Constant Rule, Power Rule, Constant Multiple Rule, Sum and Difference Rules, Product Rule, Quotient Rule, and Chain Rule.
   (e) Use derivatives to find rates of change.
   (f) Find the derivative of a trigonometric function.
   (g) Find a higher-order derivative of a function.
   (h) Distinguish between functions written in implicit form and explicit form.
   (i) Use implicit differentiation to find the derivative of a function.
   (j) Use related rates to solve application problems.

3. *Applications of Differentiation*

   (a) Understand the definition of extrema of a function on an interval.
   (b) Understand the definition of relative extrema on an open interval.
   (c) Find extrema on a closed interval.
   (d) Use Rolle's Theorem and the Mean Value Theorem.
   (e) Determine intervals on which a function is increasing or decreasing.
   (f) Apply the First Derivative Test to find relative extrema of a function.
   (g) Determine intervals of concavity.
   (h) Find any points of inflection of the graph of a function.
   (i) Apply the Second Derivative Test to find relative extrema of a function.
   (j) Determine finite and infinite limits at infinity.
   (k) Determine the horizontal asymptotes, if any, of the graph of a function.

(l) Analyze and sketch the graph of a function.

(m) Solve applied minimum and maximum problems.

(n) Approximate a zero of a function using Newton's Method.

(o) Understand the concept of a tangent line approximation.

(p) Estimate a propagated error using a differential.

4. *Integration*

(a) Use indefinite integral notation for antiderivatives.

(b) Use basic integration rules to find antiderivatives.

(c) Find a particular solution of a differential equation.

(d) Use sigma notation to write and evaluate a sum.

(e) Understand the concept of area, and approximate the area of a plane region.

(f) Find the area of a plane region using limits.

(g) Understand the definition of a Riemann sum.

(h) Evaluate a definite integral using limits and geometric formulas, as well as properties of definite integrals, and the Fundamental Theorem of Calculus.

(i) Use the Mean Value Theorem for Integrals.

(j) Find the average value of a function over a closed interval.

(k) Understand and use the Second Fundamental Theorem of Calculus, as well as the Net Change Theorem.

(l) Use a change of variables, General Power Rule for Integration to find an indefinite integral and evaluate a definite integral.

(m) Evaluate a definite integral involving an even or odd function.

(n) Find the area of a region between two curves (intersecting or not) using integration.

(o) Describe integration as an accumulation process

(p) Find the volume of a solid of revolution using the disk/washer/shell method, and compare the uses of the disk method and the shell method.

5 Technical Requirements

5.1 Computer

- A high-speed Internet connection is highly recommended.

- 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 (email in particular) 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 Printer/Scanner

You will need access to a printer/scanner in order to print out written assessments such as projects or exams, and scan them in order to submit via Canvas. You may download an app such as 'Adobe Scan' on your device in order to scan your work and convert to a PDF for submission.

5.3 Web Conferencing

Web conferencing will be used in this course, particularly during office hours and study sessions. For the online sessions, 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.â 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 Canvas:

7.1 Tracking Course Activity

Canvas 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

When you submit an assignment (quiz/project) via Canvas, please do so by submitting as an attachment in the appropriate dropbox.

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. Monday-Friday, you can usually expect a response within 24 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

- You have 4 late passes in this course that may be used for either homework or projects (with the exception of, perhaps, the final project) and allow you 5 extra days from the time I approve the request. You do not need to provide a reason for using a late pass – it doesn't matter if you're sick, working on assignments for another class, or attending a concert – they're yours to use as you please.

I do, however, recommend using them wisely! Please let me know at in advance of the due date via UNM email if you'd like to use a late pass. The quizzes, midterm and final exams, and final project must be submitted on time to receive credit.

- **For timed quizzes, it is very important to correctly submit a clear, readable PDF document in the Canvas dropbox by the due time.** Quiz dropboxes will close 1 minute after the due time. You must make sure to give yourself time to create your PDF (either with a scanner or phone app such as Adobe Scan), send to yourself (emailing yourself a copy works well), save onto your computer, then submit the PDF document as an attachment in the Quiz dropbox. Once the dropbox closes, you won't be able to submit the quiz. Please allot yourself at least 5 minutes (potentially up to 10 minutes until you're confident in the process) to do this so that your quiz can be submitted on time and be accepted for grading.

- 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 experiencing a long-term illness or other difficult circumstances which affect your ability to complete course requirements, please let me know as soon as possible. Certain exceptions can be made in the case of long-term medical emergencies or other circumstances. This may mean that when you are feeling better you will need to spend a lot of extra time to catch up.

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 Canvas, 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.

- WebAssign access will be required to complete the homework portion of this course, and a digital copy of the textbook will be included with access.

  Please note that you will gain access to the WebAssign course and e-book using RedShelf course materials link in Canvas (this is an inclusive access course).

9.1 Instructions for Registering a WebAssign Account

- **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 not required, but STRONGLY encouraged. Regular attendance in class is one of the most important factors in your successful completion of the course. If you stop attending class and completing components of the course for any reason, it is your responsibility to make sure you drop the class by the appropriate deadlines, 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 week of the semester.

11 Course Structure

This course will consist of the following graded components:

- Homework (20%)

  - Expect 2-3 homework assignments per week, to be completed via WebAssign. At the end of the semester, your lowest 2 homework grades will be dropped, and that average will be imported into Canvas gradebook representing 20% of your final grade.

- Quizzes (10%)

  - Expect 4-5 timed quizzes where you will have a short time period (avg 45 min) to submit your handwritten work to a quiz released in Canvas at the beginning of class. Your handwritten work will be submitted as a **single PDF document** and graded via Canvas. Quizzes that aren't submitted in the dropbox by the due time or aren't submitted as a single, readable PDF will not be eligible for grading. For this, you may find a free phone document scanner such as 'Adobe Scan' useful to save you some time if you don't have immediate access to a scanner. Quiz solutions will be discussed in class, immediately following the quiz. Because of this, no quizzes can be made-up after they have been given to the class. These grades will be posted throughout the semester in Canvas. At the end of the semester, your lowest quiz grade will be dropped, and the resulting average will represent 10% of your final grade. These quizzes are a great reflection of what the upcoming exams will look like.

- Projects (20%)

  - You will complete 2 projects during this course.
  - Each project will count for 10% of your final grade.

- Midterm Exam (20%)

    - The **in-person** midterm exam will be held on **Thursday, June 27, 2024 at 3:00pm at the UNM Valencia Workforce Training Center** (1020 Huning Ranch Loop SW, Los Lunas, NM, 87031) (about 15 minutes south of Albuquerque, off of I-25). You may take this exam at another college/university testing center with a proctor if arranged ahead of time (no later than 2 days before the exam) with the testing center and myself.

- Final Exam (30%)

    - The **in-person** comprehensive final exam will be held on **Monday, July 29, 2024 at 3:00pm at the UNM Valencia Workforce Training Center** (1020 Huning Ranch Loop SW, Los Lunas, NM, 87031) (about 15 minutes south of Albuquerque, off of I-25). You may take this exam at another college/university testing center with a proctor if arranged ahead of time (no later than 2 days before the exam) with the testing center and myself.

For written assessment submissions such as quizzes, exams, and projects you should generally expect your grades within 3-7 days. 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

Grades for all written assignments can be found in the 'Grades' section in Canvas throughout the semester. There is a rolling final average that is weighted according to the grading schema described in the **Course Structure** section.
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

Summer 2024: 8-week classes (Full term)

- **Monday, June 3rd**: First day of class, classes available in Canvas.

- **Friday, June 7th**: Last day to add a class or to change credit hours or grade mode in LoboWEB.

- **Friday, June 14th**: Last day to drop without "W" grade and with 100% refund on LoboWEB.

- **Friday, July 19th**: Last day to drop without Dean's permission on LoboWEB. Will receive "W" grade and will be responsible for tuition for the course.

- **Thursday, July 25th**: Last day to change grade mode with form, or drop with Dean's permission. Will receive "W" grade and will be responsible for tuition for the course.

15   UNM Policies

15.1   UNM Covid Policy

Effective March 13, 2023, The University of New Mexico will no longer require the COVID-19 primary vaccine series and initial booster for students and employees.
UNM Health and Health Sciences programs and clinical areas will continue to maintain their COVID-19 vaccine requirements.
Individuals with a hire date of March 13, 2023, or later are no longer required to provide proof of vaccination or apply for an exemption.
Students enrolling in classes after March 13, 2023, are no longer required to provide proof of vaccination or apply for an exemption.
UNM will no longer require students, faculty, and staff to report COVID-19-positive tests through the online portal or upload COVID-19 vaccination records.
UNM continues to strongly recommend that the Lobo community remain up to date with vaccinations, stay at home if sick, and follow CDC guidelines for all COVID-19 matters.

15.2   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*.

15.3   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.

15.4   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.

15.5   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