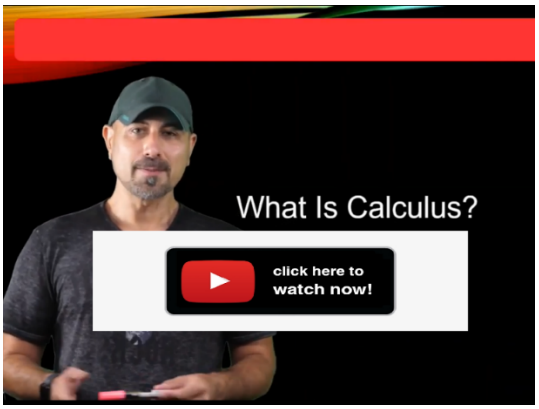
On-Demand - Math 137: Calculus II

Instructor: Dr. Ahmet Ozkan Ozer (Dr. Ozz)
Office: COHH #4127
Zoom Meeting ID: 97776597980

Email: ozkan.ozer@wku.edu
Phone: 985-30-OZKAN

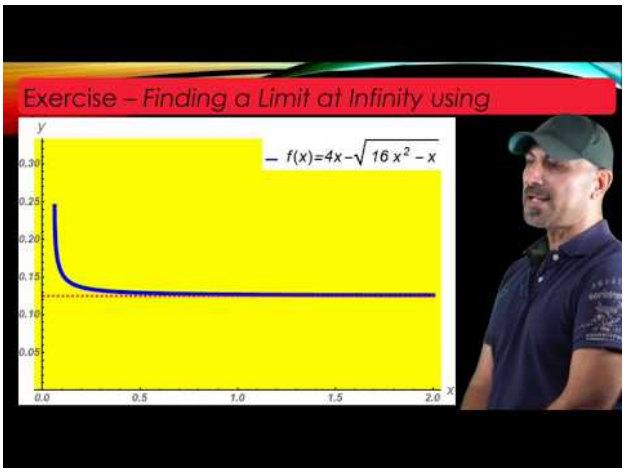
WHAT is CALCULUS?
Click here or on the video to watch



COURSE DESCRIPTION
Calculus II

MATH 137 is the second course in one-variable calculus for math, science, and engineering majors. Topics include inverse trig functions, hyperbolic trig functions, various methods of integration, sequences and series, polar and parametric functions

- **Lecture videos and recitations are provided to enhance your learning for the second Calculus course in a series of four Calculus courses.**
- **These videos are professionally RECORDED and EDITED by Dr. Ozz.**
- **Solutions for key problems of Calculus II are provided in the videos for you to go through at your own pace in your spare time. Click on the videos below to see some examples.**



MEETING TIMES

As this is an online course, no physical meetings are required. This is also a self-paced course, so you can complete this course in as little as seven weeks or take up to nine to twelve months to complete the course. Contact WKU On Demand to learn the exact deadline for completion of the course.

LEARNING OBJECTIVES

Upon completion of the course students will:

1. Be able to differentiate and integrate the inverse trigonometric and hyperbolic functions using different techniques such as integration by parts, trigonometric substitutions, partial fractions, and other methods.
2. Be able to apply the integration techniques to real world problems such as finding the area between curves, volume or surface area of a revolution, arc length, work, moment, center of mass, etc.
3. Be able to understand infinite series and test their convergence or divergence using appropriate tests, i.e. the ratio test, nth root test, telescoping series, geometric series; alternating series.
4. Be able to expand functions in power series.
5. Be able to work with parametric curves using differential and integral techniques.
6. Be able to analyze functions and their graphs in polar coordinates.

Check the end of the syllabus to learn about specific learning objectives for each chapter.

PREREQUISITES: A grade of C or better in Math 136.

REQUIRED MATERIALS

Textbook: Calculus of a Single Variable: Early Transcendental Functions (with WebAssign Access), 7th Edition, by Larson, ISBN 281000002784B
ISBN for optional low-cost loose-leaf copy: 281000002783B
(Also available online at www.webassign.net)

WebAssign access code is required for tests, quizzes, and homework assignments.
Course ID is not needed. Register through Blackboard.

Calculator: A graphing calculator (TI-83 Plus or TI-84 Plus or Silver Edition), except the TI-92 or TI-89 or equivalent, is recommended for the assignments and Testing Center exams.

Textbook Information: (Please read before purchasing anything for this course.)
This course participates in The WKU Store's Day One Access program. This program is designed to provide immediate access to required materials for all students at prices cheaper than any other option.

Required materials will be available to you automatically (via Blackboard) by enrolling in this course unless you choose to opt-out. By participating in this program, The WKU Store will bill your Student Billing account, and you will see a charge appear under this Term along with Tuition and Fees ("Account Summary by Term" under the Student Services tab) labelled as either "The WKU Store Purchases" or "Day One Access." For more information on this program or to opt-out of participation, please visit the Day One Access information page.

The cost of the e-book and WebAssign is approximately $80, which will be charged to your student bill one week following your enrollment in the course. Students who stay enrolled in Day One Access are also eligible to purchase an optional low-cost loose-leaf copy of the textbook for only $45.00. (Students who opt-out of Day One Access are not eligible to purchase this low-cost loose-leaf version of the book.)

Students who wish to opt-out of this program may do so. However, you must opt-out within the first week of your enrollment to avoid being charged for Day One Access. By opting out, you agree to have your e-book and Webassign access terminated and you will be responsible to obtaining the required materials on your own. If you have purchased the optional low-cost loose-leaf book from The WKU Store, you must return it before the opt-out deadline in order complete the opt-out process. It must also be in its original shrink-wrap.

**********Contact WebAssign directly if you have a technical issue with the website. The phone number is (800) 955 8275********

COURSE WEBSITE AND REQUIRED TECHNOLOGIES: We will be using WKU's Blackboard (as the homepage) and Cengage's WebAssign for the assignments and the e-book for this course. Lecture notes/videos, recitation notes/videos, surveys, and announcements are all uploaded to the corresponding course modules in Blackboard. Please note, all course announcements posted in Blackboard will be sent to your WKU EMAIL address. All assignments will be taken in the WebAssign Platform. Follow the link at the Blackboard homepage to access to WebAssign. All the course videos are linked to my YouTube Channel.

- **Broadband Reliable Internet Connection:** Your internet connection is critical for viewing YouTube videos and other supplemental materials in Blackboard. Moreover, Cengage web-based learning platforms require broadband internet access and supported web browsers and plugins. Visit the following website for more info: https://www.webassign.net/manual/student_guide/common/system-requirements.htm

  Access to a reliable internet connection is required for this course. A problem with your Internet access may not be used as an excuse for late, missing, or incomplete coursework. If you experience problems with your Internet connection while working on this course, it is your responsibility to find an alternative Internet access point, such as a public library or a Wi-Fi hotspot.

- **Smart Phone & Zoom Software:** During the online quizzes (or exams), a microphone and a webcam may be needed. The smartphone's cam and mic must be turned on must be during the Zoom proctoring. For Testing Center exams, this may not be needed.

- **WebAssign Technology Requirements:** Visit WebAssign System Requirements for the specifics.

- **LockDown Browser of WebAssign**: For online exams (if any needed due to COVID-19), you must Install LockDown Browser of WebAssign. While you are working on an assignment that

requires LockDown Browser, you cannot use other applications, view other Web sites, copy, or print. Also, certain WebAssign features are not available when using LockDown Browser.

- **About Uploading Your Hand-written Work for Online Assignments:** Prepare the requested file in the required format (PNG, JPEG, or PDF) and then upload it. Your file cannot be larger than 10 MB. Visit Uploading a File to Show Your Work for more info. By default, you may receive full credit automatically after submitting your answer. Your points will be adjusted after your answer is graded by your instructor.

RECITATIONS VIDEOS

Recitations for this course are designed via recorded videos. At every course submodule, there is a PowerPoint file where you can find the links to the recitation questions and the videos. For each section, there are 5-13 videos with solved exercises by Dr. Ozz, which are similar to the ones in the assignments. It is recommended to read the lecture notes first, and get engaged with recitation videos next.

HOMEWORK and CHAPTER REVIEWS (15%)

In total, 30 homework assignments and 4 chapter reviews are to be completed in the online assessment system, WebAssign. It is your responsibility to keep up with the homework assignments. You will be allowed ONE try for multiple-choice questions and TEN tries for all other questions. A grade of at least 70% will be necessary on each assignment for a student to be allowed to take the next available assignment. Technical difficulty is not a valid excuse for missing homework. For each homework assignment, there are 0-3 questions to turn in your hand-written work for instructor feedback. Simply take a picture of your hand-written work, upload the file to WebAssign. The feedback will be provided back to you in 1-3 days after the assignment is turned in. Your five lowest homework scores will be dropped at the end of the course before calculating your final grade. To cover all other contingencies the 5 lowest homework scores will be dropped at the end of the semester.

Please email the instructor when you have completed each homework to prompt him to provide constructive feedback for your hand-written solution(s).

QUIZZES (30%)

In total, 14 quizzes are to be completed in the online assessment system, WebAssign. Every quiz involves questions from the preceding two sections. You will have 75 minutes to complete each quiz. You will be allowed ONE try for multiple-choice questions and THREE tries for all other questions. In each quiz, there are 1-2 questions for which you will need to turn in your hand-written work for instructor grading. Simply take a picture or your hand-written work, and upload the file to the system at WebAssign. For those questions, WebAssign grading will not be taken into consideration. The feedback will be provided back to you in 1-3 days after the assignment is turned in. To cover all other contingencies the 4 lowest quiz scores will be dropped at the end of the semester.

Please email the instructor when you have completed each quiz to notify him grade the written portion of the quiz.

TESTS (20+15%) and FINAL EXAM (20%)

There will be two 120-minute tests and a final exam. The first test is proctored and is taken at a Testing Center and the second one will be taken online in WebAssign. You may bring your own formula card of the size 4x6” and 8x11” for each test and the final, respectively, and both sides can be used. You will be

allowed ONE try for multiple-choice questions and TWO tries for all other questions. Only non-graphing TI-83/84 calculators (except the TI-92 or TI-89 or equivalent) are allowed on exams. Formula sheet(s) will be provided. You will need to provide the details of each question (show your work) on scratch paper and upload images documenting your work to WebAssign.

Test 1 and the Final Exam must be taken at a testing center, at either WKU or a certified proctoring location near you. Please keep in mind that there may be an associated proctoring fee at non-WKU testing centers. For more information on scheduling proctored exams, please visit On Demand's website.

Please email the instructor when you have completed each exam to prompt him grade the written portion.

FORMATIVE COURSE ASSESSMENT SURVEY (100 POINTS OF EXTRA CREDIT)

To close the teaching-to-learning loop with your meaningful feedback, a formative course assessment surveys are given. The survey consists of questions examining your overall learning experience and impression of the instructional videos, quizzes, homework assignments, online assessment system, and other course resources. The survey will also contain a series of open-ended questions, which are my favorite because they give you the freedom to express your perception of the course. The survey will be available in Blackboard at the end of the Chapter 7 module. The feedback you provide is very essential for me and will be used to affect immediate adjustments in the day-to-day operations of the course. You will be given extra credit of 100 points by participating in each survey.

GRADING and GRADING SCHEME: The course contains 30 homework assignments, 4 chapter-review assignments, 14 quizzes, 2 tests, and 1 final exam. All assignments are worth 100 points. Your final grade is based on the following grading scheme:

Homework (online)	Quizzes (Online)	Test 1	Test 2	Final Exam	Surveys (Extra Credit)	**Total**
15%	30%	20%	15%	20%	2%	**102% possible**

Grading Scheme				
A	B	C	D	F
>90%	80-89%	70-79%	60-69%	<59%

COMMUNICATION BY THE INSTRUCTOR

The best way to contact me is via email. My email address is provided at the beginning of the syllabus. I usually check my email on a daily basis during the school year and at least every few days during the summer and winter breaks. If I am out of the country or the state, the frequency I check my email will vary depending on my access to the internet, but I can still usually check it at least every few days. Regardless of the time of year, if you send me email over the weekend it may take more time for me to respond than through the weekdays. If necessary, we may be able to arrange a meeting over the phone, Zoom, Google Phone, or face-to-face.

NETIQUETTE: Netiquette refers to the guidelines for online communications. In a nutshell, it is the etiquette for the Internet, and should be used for all class communication for the course: email, discussion forums, messages, etc. Even though this is an online course, students are expected to conduct themselves in a manner that is respectful and upholds a supportive, mutually beneficial learning environment.

Netiquette provides excellent guidelines for online behavior that facilitates the productive and thoughtful exchange of ideas. Some of the basic tenets of Netiquette include:

- **Be respectful.** Remember that you are communicating with actual people. Always be courteous and show respect, especially when there are differences of opinion, beliefs, or cultural backgrounds.
- **Think before you post.** Be aware of who may be able to view your posting, and how your post may be interpreted. Try to maintain a fair and objective tone.
- **Write clearly.** Even though the online environment may seem more informal than your face-to-face class, this is still an academic course and mature communication is expected. Correct spelling and grammar are required and proper composition and punctuation are expected.
- **Use appropriate language and style.** Profanity or offensive wording will not be tolerated. You should avoid using ALL CAPS and repeated punctuation (???? or !!!!).
- **Be considerate of others.** Do not make derogatory, condescending, or harassing remarks. Communication should be well-intentioned, well-articulated, and aimed at fostering a positive learning environment. Be aware of how sarcasm may be misinterpreted by your readers.
- **Allow for misunderstandings.** Keep in mind that writing often conveys the incorrect tone or intention in the absence of nonverbal communication. You should make allowances. What you may perceive as rudeness may be unintended.
- **Cite your sources.** If you post work that is not your own, be sure to reference your sources.

ACADEMIC DISHONESTY: Students who commit any act of academic dishonesty may receive from the instructor a failing grade in that portion of the coursework in which the act is detected or a failing grade in the course without possibility of withdrawal. The faculty member may also present the case to the Office of Judicial Affairs for disciplinary sanctions.

STUDENT RESOURCES PORTAL

There is a student resource portal (http://www.wku.edu/online/srp/) that you can access to help succeed in the course.

TITLE IX MISCONDUXT/ASSAULT STATEMENT

Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) at at https://www.wku.edu/policies/docs/182.pdf and Discrimination and Harassment Policy (#0.2040) at https://www.wku.edu/policies/docs/251.pdf.

Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121.

Please note that while you may report an incident of sex/gender based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and MUST report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

REGULAR AND SUBSTANTIVE INTERACTION STATEMENT: The U.S. Department of Education requires that distance education courses must include regular and substantive interaction between students and faculty. For more information about Regular and Substantive Interaction (RSI) at WKU, please visit the Regular and Substantive Interaction in Online and Distance Learning webpage.

In this course, regular and substantive interaction will take place in the following ways:

- Regular virtual office hours
- Timely and detailed feedback on student's coursework provided within 1-3 days after the submission of an assignment
- Providing information or responding to questions about the content of the course or course competency

ADA STATEMENT: In compliance with the University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu. Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

This course uses third party websites and tools that are committed to providing an accessible experience to their users. You can read the individual accessibility statements for these platforms by clicking the links below:

- WKU's Accessibility Statement
- Blackboard's Accessibility Statement
- WebAssign's Accessibility Statement
- YouTube's Accessibility Statement
- Zoom's Accessibility Statement

CHAPTER OBJECTIVES in details

By the end of the course, you will be able to:

Chapter 5 (5.8-5.9). Integration of Inverse Trigonometric and Hyperbolic Functions

- Integrate functions whose antiderivatives involve inverse trigonometric functions
- Differentiate and integrate functions involving inverse hyperbolic functions
- Use the method of completing the square to integrate a function
- Review the basic integration rules involving elementary functions

Chapter 7 (7.1-7.4, 7.6). Applications of Integration

- Find the area of a region between two curves or between intersecting curves using integration.

- Describe integration as an accumulation process
- Find the volume of a solid of revolution using the disk method or washer method
- Find the volume of a solid with known cross sections
- Find the volume of a solid of revolution using the shell method
- Compare the uses of the disk method and the shell method
- Find the arc length of a smooth curve and the area of a surface of revolution
- Find the center of mass of a in one or two dimensions
- Use the Theorem of Pappus to find the volume of a solid of revolution

Chapter 8 (8.1-8.5, 8.8). Basic Integration Rules

- Review procedures for fitting an integrand to one of the basic integration rules
- Find an antiderivative using integration by parts
- Solve trigonometric integrals involving powers of sine, cosine, secant, tangent, and sine-cosine products
- Use trigonometric substitution to find an integral
- Use integrals to model and solve real-life applications
- Use partial fraction decomposition with linear/quadratic factors to integrate rational functions
- Find an indefinite integral involving rational functions of sine and cosine
- Evaluate an improper integral that has an infinite limit of integration
- Evaluate an improper integral that has an infinite discontinuity

Chapter 9 (9.1-9.10). Infinite Series

- Write the terms of a sequence, determine whether a sequence converges or diverges
- Write a formula for the nth term of a sequence
- Use properties of monotonic sequences and bounded sequences
- Understand the definition of a convergent infinite series
- Use properties of infinite geometric series
- Use the nth-Term Test for Divergence of an infinite series
- Use the Integral Test to determine whether an infinite series converges or diverges
- Use properties of p-series and harmonic series
- Use the Direct Comparison Test, Limit Comparison Test, Ratio Test, Root Test, or Alternating Series Test to determine whether a series converges or diverges
- Use the Alternating Series Remainder to approximate the sum of an alternating series
- Classify a convergent series as absolutely or conditionally convergent
- Rearrange an infinite series to obtain a different sum
- Find polynomial approximations of elementary functions and compare them with the elementary functions
- Find Taylor and Maclaurin polynomial approximations of elementary functions
- Use the remainder of a Taylor polynomial
- Find the radius and interval of convergence of a power series
- Differentiate and integrate a power series
- Find a geometric power series that represents a function
- Construct a power series using series operations
- Find a Taylor, Maclaurin, or a binomial series for a function

- Use a basic list of Taylor series to find other Taylor series

Chapter 10 (10.1-10.5) Conics, Parametric Equations, and Polar Coordinates

- Analyze and write equations of parabolas, ellipses, and hyperbolas
- Sketch the graph of a curve given by a set of parametric equations
- Eliminate the parameter in a set of parametric equations
- Find a set of parametric equations to represent a curve
- Understand two classic calculus problems, the tautochrone and brachistochrone problems
- Find the slope of a tangent line to a curve given by a set of parametric equations
- Find the arc length of a curve given by a set of parametric equations
- Find the area of a surface of revolution (parametric form)
- Rewrite rectangular coordinates and equations in polar form and vice versa
- Sketch the graph of an equation given in polar form
- Find the slope of a tangent line to a polar graph
- Identify several types of special polar graphs
- Find the area of a region bounded by a polar graph
- Find the points of intersection of two polar graphs
- Find the arc length of a polar graph
- Find the area of a surface of revolution (polar form)
- Analyze and write polar equations of conics