MTH 133-201: Calculus II
Course Syllabus - Summer B 2019

Instructor:	Joshua Ruiter
Lecture times:	MTWF 10:20am-12:10pm
Lecture location:	A130 Wells Hall
Instructor's Office:	C542 Wells Hall
Instructor's Office Hours:	4-5:10pm in the MLC on Tuesdays, Wednesdays, and Thursdays
Instructor's e-mail:	ruiterj2@math.msu.edu
Course Web Page:	https://math.msu.edu/classes/mth_133/. Note that the uniform syllabus on that web page does not apply to summer sections, although it is very similar.

Required Course Materials
WeBWorK: https://www.math.msu.edu/webwork/
Textbook: Recommended: Custom MSU MTH 133 Calculus 2, Stewart ISBN-13: 978-1-305-51388-4

Prerequisites: Material covered in MTH132.

Course Description: This is a 3 credit course. It serves as a continuation of MTH132, where you will further explore the concepts of derivatives, limits, integrals, and their applications. The topics covered in the class include study integration techniques, polar and parametric curves, applications of integrals, and the study of sequences and series.

Teaching Philosophy: Learning takes place while doing homework. My role is to prepare you (through lectures) to build understanding while doing homework.You will be best prepared for tests and quizzes by putting significant effort into homework.

Class Expectations:

1. You are expected to come to every class.

2. Reviewing lecture notes is considered a part of the homework assignment. It is expected that you review the notes after each lecture in order to understand the course material in depth in preparation for exams.

3. You are expected to check your email and the D2L site regularly. This is where I will announce any changes to the schedule, or post material such as answer keys for past quizzes, etc.

4. You are expected to pay attention and participate in class.

5. You are expected to spend at least 2 hours between each lecture working on your homework, reading the book, lecture notes and supplementary materials.

Attendance: Students are expected to attend all class meetings and are responsible for all of the material covered in class and in the homework. You will not be graded on attendance. However, you will be tested on all of the material covered in class, so it will be very difficult to do well in the course without attending regularly.

Homework: You are required to do homework through Webwork. To register for Webwork, go to https://www.math.msu.edu/webwork/ and follow the instructions.

There is a fee that helps the Mathematics department create, maintain, and develop Webwork. The fee is due on Friday, July 12 at 10am, and Webwork can be used for free until then. The fee is non-refundable, so if you drop the class after paying the fee, you will not be refunded. If you are unsure whether or not you will drop the class, use Webwork without paying until a few days before.

If you forget to pay and get dropped from Webwork, go to the Webwork help page and use your MSU Net ID and password. Find the correct section and pay the fee, following the directions on that page. There is a processing time of up to 2 hours after you pay the fee, and your account will be back online after that. The work you have done will be saved.

Always remember that purpose of doing Webwork is to **learn**, not to get points. While Webwork is a part of your grade, the points from a single Webwork problem do not significantly impact your grade, so it is not worth stressing over. I understand how frustrating it is to know you did the problem right, but be off by a small mistake, and get no partial credit from Webwork. If you are confident that you understand the way to solve a problem, and just can't get Webwork to agree, just move on to the next problem.

Project: Each student will submit a proposal for and complete a project on something related to the class. More details will be provided a week or so into the course.

Quizzes: There will be four 15-minute quizzes on the Fridays with no exam (see schedule for dates). Each quiz will take place at the beginning of class, so if you are late to class, you will miss it and not be able to make it up. No notes, no books, calculators, or smart devices of any type will be allowed in the quizzes. Students are expected to take all quizzes. Makeup quizzes follow the same rules as makeup exams.

Midterm Exams: There will be two 50-minute midterm exams in class on the days Friday, July 19 and Friday August 9. No notes, books, calculators, phones, tablets, or computers will be allowed on the exams. *Any test missed without an authorized excuse will count as 0.*

Final Exam: There will be a 120-minute final exam on Wednesday, August 14, the last day of class. The exam will be in our usual classroom during our usual class time. No notes, no books, no smart devices of any type will be allowed in the Final Exam. *You must take the final exam in order to pass this course.* The university has strict requirements for exceptions; more information can be found here: `http://www.reg.msu.edu/ROInfo/Calendar/FinalExam.aspx`

Make-up Exam Policy: In rare situations, students who have made travel plans prior to the beginning of the semester for an exam day and have documentation showing this may request accommodations for missing the exam. However, students must request this from their instructor during the first week of the semester. After the first week no travel accommodations will be granted.

Make-ups for exams will only be given for medical or emergency absences and only with a written excuse from doctor or other authorized individual. Such exams are given only in extreme cases that are approved by the instructor as sufficiently convincing and serious.

Evaluation: Your course grade will be based on the **maximum score** of the following two calculations:

10% Quizzes	10% Quizzes
15% Webwork Homework	15% Webwork Homework
5% Project	5% Project
20% Midterm Exam 1	20% Best of 2 Midterm Exams
20% Midterm Exam 2	50% Final Exam
30% Final exam	

Final grades will be assigned based on the following table:

4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.0
90%-100%	85%-89%	80%-84%	75%-79%	70%-74%	65%-69%	60%-64%	Below 60%

Exams and Other Important Dates

Class Begins	Monday, 7/1/2019
Open adds end (8:00pm)	Wednesday, 7/3/2019
Webwork fee deadline	Friday, 7/12/2019
Last day to drop the class with tuition refund (8:00pm)	Friday, 7/12/2019
Midterm Exam I	Friday, July 19
Last day to drop the class with no grade reported (8:00pm)	Wednesday, 7/24/2019
Midterm Exam II	Friday, August 9
Final Exam	In class, Wednesday 8/14/2019.

Grading Disputes: If you have any question regarding the grading of an exam or lab, your paper must be handed back to the instructor for re-grading at the end of the class period during which you received it. *Once a graded paper has left the classroom, no grading changes will be made.*

Students with Disabilities: Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at `rcpd.msu.edu`. Once your eligibility for an accommodation has been determined, you will be issued a Verified Individual Services Accommodation (VISA) form. Please present this form to me at the start of the term and/or at least a week prior to the accommodation date (test, project, etc.). Requests received after this date may not be honored.

Academic Honesty: Cheating in any form will not be tolerated and will be reported. You will receive a zero on any assignment in which there is a case of cheating. This includes, but is not limited to, plagiarism, failure to give proper citations, and copying another's work.

If you are preparing an assignment and have a question about whether you are adhering to this policy, please ask your instructor. If you work on an assignment with other students, you must give credit to your collaborators. MSU's policy on academic integrity can be found at the following URL: `https://www.msu.edu/~ombud/academic-integrity/index.html`.

Getting Help:

Office hours. In lieu of holding office hours, I will be working in the MLC for several hours each week. You are encouraged to bring questions to me there, and I will prioritize helping you before students in other sections. If your schedule conflicts with the scheduled hours, please make an appointment by sending a request by e-mail, and I will meet with you in my office or in the MLC at another time.

Please do not think of this as an inconvenience to your instructor; additional help is available if you seek it out. However, it is your responsibility to come to the MLC for help only after first making a sincere effort to answer questions on your own. Learning is difficult: work hard, try new ideas, and ask questions.

Math Learning Center (MLC). The MSU Math Learning Center is located at C126 Wells Hall, where a monitor will direct you to the appropriate room for this course. The MLC provides assistance for students' WeBWorK assignments. You can find more information about the MLC here: `https://www.math.msu.edu/mlc/`

Course Objectives: Upon completion of this course, the student should be able to do the following.

- Apply L'Hospital's Rule to calculate limits of various indeterminate forms.

- Calculate derivatives of inverse trigonometric functions, hyperbolic trigonometric functions, exponential and logarithmic functions.

- Recognize when to apply logarithmic differentiation.

- Calculate slope of tangent lines for curves given parametrically or in polar coordinates.

- Calculate volumes of solids of revolution.

- Apply integration to force functions to calculate work.

- Apply exponentials to solve real world problems such as: population growth, decay of radioactive elements, and Newton's Law of Cooling.

- Solve initial value problems for separable differential equations.

- Recognize when to apply integration techniques such as: integration by parts, trigonometric substitution, partial fractions.

- Compute arc length of a function given: in Cartesian coordinates, in polar coordinates, parametrically.

- Solve for the area between polar curves.

- Determine the limit of a sequence by applying previous calculus knowledge.

- Calculate the limit of a geometric series.

- Apply tests to determine convergence/divergence of series including: n-th term test, p-series test, alternating series test, ratio test, integral test, and comparison tests.

- Apply the ratio test to determine the interval of convergence for a power series.

- Memorize common power series representations of functions.

- Determine power series representations of more complicated functions by manipulating known power series representations.

- Apply the Taylor series formula to calculate even more power series representations of various functions.

The schedule on the next page is possibly subject to changes which will be announced in class and sent by email. It is unlikely any of the quiz dates will change, and extremely unlikely any of the exam dates will change.

It is unlikely we will cover exactly the sections listed each day. Roughly, we need to cover 1.5 sections per class period, and we may fall behind or ahead. Regardless, we will cover the sections in this order, because this is the order of appearance for webwork.

Week 1

Monday, July 1	*5.2* - Calculating volumes of rotation with integrals
	5.4 - Physics applications of integration to work
Tuesday, July 2	*6.1* - Inverse functions
Wednesday, July 3	*6.2* - Calculus involving the natural logarithm (log base e)
	6.3 - All the properties of the number $e = 2.7.1828\ldots$ that you ever wanted to know
Friday, July 5	**Quiz 1**
	6.4 - Logarithms and exponential functions in bases other than e

Week 2

Monday, July 8	*6.5* - Exponential growth and decay, Newton's law of cooling, compound interest
	6.6 - Inverse trigonometric functions and their derivatives
Tuesday, July 9	*6.7* - Hyperbolic functions and their derivatives
Wednesday, July 10	*6.8* - Making sense of $\frac{0}{0}$ and other strange beasts using L'Hopital's rule
	7.1 - Integration by parts, a.k.a. the product rule for integrals
Friday, July 12	**Quiz 2**
	7.2 - Integrals of trigonometric functions

Week 3

Monday, July 15	*7.3* - Trig substitution, using trig functions to integrate other things
	7.4 - Integration by partial fractions
Tuesday, July 16	*7.8* - Integrals involving infinity ("improper" integrals)
Wednesday, July 17	*7.5* - Summarizing our various integration techniques
	Exam 1 review
Friday, July 19	**Exam 1** - Sections 5.2, 5.4, 6.1-6.8, 7.1-7.5, 7.8

Week 4

Monday, July 22	*11.1* - Sequences (infinite lists of numbers)
	11.2 - Series (infinite sums of numbers)
Tuesday, July 23	*11.3* - Tests for series convergence, part I - p-test, integral test
Wednesday, July 24	*11.4* - Tests for series convergence, part II - comparison test, limit comparison test
	11.5 - Alternating series test (might skip this section, not covered in webwork)
Friday, July 26	**Quiz 3**
	11.6 - Tests for series convergence, part III - ratio test, root test

Week 5

Monday, July 29	*11.7* - Summarizing all the series tests
	11.8 - Power series, part I
Tuesday, July 30	*11.9* - Power series, part II - more powerful, more serious
Wednesday, July 31	*11.10* - Taylor series
Friday, August 2	**Quiz 4**
	11.11 - Error approximation for Taylor series and some applications to physics

Week 6

Monday, August 5	*10.1* - Curves and parametric equations
	10.3 - Measuring things with circles using polar coordinates
Tuesday, August 6	*8.1* - Arc length for curves
	10.2 - Tangent lines and arc length for parametric curves
Wednesday, August 7	Catching up, exam 2 review
Friday, August 9	**Exam 2** - Sections 11.1-11.11, 10.1-10.3

Week 7

Monday, August 12	*10.4* - Arc length and area using polar coordinates
Tuesday, August 13	Final exam review
Wednesday, August 14	**Final exam**