

MA 113 - Calculus I (Spring 2017)

Official Course Description:

A course in one-variable calculus, including topics from analytic geometry. Derivatives and integrals of elementary functions (including the trigonometric functions) with applications. Lecture, three hours; recitation, two hours per week. Students may not receive credit for MA 113 and MA 137. Prereq: Math ACT of 27 or above, or math SAT of 620 or above, or MA 109 and MA 112, or MA 110, or consent of the department. Students who enroll in MA 113 based on their test scores should have completed a year of pre-calculus study in high school that includes the study of the trigonometric functions. Note: Math placement test recommended

Instructors:

MA 113 consists of lectures and recitations. Each large lecture is divided into multiple sections for recitations. When combined, this course website and the website for lecture section 0XY comprises the syllabus for MA 113 0XY.

The [course calendar](#) lists all assignments and exam dates.

The list below gives the instructors. Course meeting times are available from myuk.uky.edu.

<i>Section</i>	<i>Role</i>	<i>Name</i>	<i>E-Mail</i>	<i>Web page</i>
001 - 010	Lecturer	Benjamin Braun	benjamin.braun@uky.edu	Web page
011 - 015	Lecturer	David Jensen	dave.jensen@uky.edu	Web page
001 & 002	TA	Karthik Chandrasekhar	ak.c@uky.edu	Web page
003 & 004	TA	Jared Antrobus		Web page
005	MathExcel Leader	McCabe Olsen		Web page

007 & 009	TA	Ashley Lawson		
008 & 012	TA	Jessica Doering		
010 & 015	TA	Ben Brodie		
013 & 014	TA	Jacob Adams		

Learning Outcomes:

Students will investigate the following six big questions:

- What are common functions used to model the change in one quantity or value when it is determined by another quantity or value?
 - Chapter 1: Linear, quadratic, exponential, logarithmic, and inverse functions. The unit circle, circular motion, and trigonometric functions.
- What functions can we use to model smoothly-changing motion? For an object in motion, how do we measure the change in position for that object at a given instant in time?
 - Chapter 2: Average and instantaneous velocity, limits, continuity, derivatives.
- What are the important mathematical properties of functions that model smoothly-changing motion? What mathematical techniques can we use to analyze those functions and develop models with them?
 - Chapters 3 and 4: Derivatives of polynomial/exponential/trigonometric functions, product and quotient rules, chain rule, implicit differentiation, maximum and minimum values, the mean value theorem, L'Hopital's rule

- What phenomena can we model using derivatives and elementary functions?
 - Chapters 3 and 4: Related rates, exponential growth and decay, optimization problems

- For an object that is continuously changing position, how do we determine the total change of position during a period of time? How do we compute the area of a two-dimensional figure with a curved boundary?
 - Chapters 4, 5, and 6: Computing areas and distances, anti-derivatives, definite integrals, the Fundamental Theorem of Calculus, substitution

- How can we use polynomials to approximate more complicated functions?
 - Chapter 3 and Handouts: Linear and higher-order approximation, Taylor polynomials

Students will gain experience in the following mathematical practices:

- Making sense of problems and being persistent while solving them,
- Effectively engaging in productive struggle,
- Collaborating productively with others, and
- Communicating through mathematical writing.

Videos about productive struggle and growth mindset research:

We will watch these videos during lecture and recitation. After watching the video, all students will spend 2-3 minutes writing a paragraph or two in response to the video. The prompt for your writing is the following question: What are specific examples where your personal experience in previous mathematics courses has aligned with the video you just watched? After writing, you will spend 2-3 minutes discussing your response with another student you are sitting near.

- [TEDx video on growth mindsets](#)
- [Veritasium video on Khan Academy and the effectiveness of science videos](#)

If you would like to learn more about growth and fixed mindset research, both generally and in the context of mathematics courses, we recommend the following two articles:

- [The Secret to Raising Smart Kids](#), by Carol Dweck
- [Is Math a Gift? Beliefs That Put Females at Risk](#), by Carol Dweck

Course policy regarding supportive discourse:

Students are not allowed to make negative comments about themselves or their mathematical ability, at any time, for any reason. Here are example statements that are now banned, along with acceptable replacement phrases.

- I can't do this -> I am still learning how to do this
- That was stupid -> That was a productive mistake
- This is impossible -> There is something interesting and subtle in this problem
- I'm an idiot -> This is going to take careful thought
- I'll never understand this -> This might take me a long time and a lot of work to figure out
- This is terrible -> I think I've done something incorrectly, let me check it again

The banned phrases represent having a fixed view of your own intelligence, which does not reflect the reality that you are all capable of dynamic, continued learning. The suggested replacement phrases support and represent having a realistic perspective regarding your abilities and your capacity for improvement.

Textbook:

Calculus: Early Transcendentals, 8th edition, by James Stewart, ISBN 9781337056403 (Chapters 1-11) or ISBN 9781337030595 (Chapters 1-16). For MA 113, you only need to obtain one of either the Chapter 1-11 text or the Chapter 1-16 text. The bookstore has custom paperback editions of the textbook for UK.

- If you plan on only taking Calculus I and II (MA 113-114), then you need chapters 1-11.
- If you plan on taking Calculus I, II, and III (MA 113-114-213), then you need chapters 1-16.

You do not need to purchase a separate WebAssign access code for this course, as we will use the WebWork online homework system.

During the last two weeks of class, students will be using this [handout on higher-order approximation](#) to supplement the textbook reading.

You purchased access to the eBook when you purchased your textbook from the UK Bookstore or Kennedy's. Instructions for accessing the eBook are available in the [Student Quick Start guide](#).

You will need our class access key: **uky 8986 5069**

WebAssign gives you free access to the eBook for two weeks after the start of class. To continue to use WebAssign after that, you will need to enter the access code that came with the textbook you bought or purchase access online.

Grading:

You may access your course grades through the [Canvas](#) system, logging in with your linkblue ID and password. Your grade in the course will be determined as follows:

Activity	Percentage of total course grade
3 Midterm Exams and a Final Exam	70%
Web Homework (WebWork)	10%
Six Written Assignments	10%
Lecture attendance:	5%
Ten Quizzes	5%

Please see your lecturer's syllabus for details on the lecture attendance grade.

Your grade will be determined as follows:

Total percent in course	At least 90.0	At least 80.0	At least 70.0	At least 60.0	Less than 59.99
Final Course Grade	A	B	C	D	E

We may adjust (or curve) the grade lines down (but not up!). Decisions about changing the grade lines will be made by the faculty after considering the difficulty of the exams and the performance of students on the exams. Typical means for exams in previous years have been in the 70's. In computing these means, we do not include scores of students who score 30 or below.

Recitation Worksheets:

In recitation, you will practice the material of the lectures using worksheets. You will work in groups and sometimes individually. For the schedule of the worksheets see the [course calendar](#). The worksheets are available for [download as a single pdf file](#).

Beginning with worksheet 2, you will be responsible for having the recitation worksheets with you for recitation classes. If you fail to do so, then it may be counted as an unexcused absence. You may print the worksheet and bring it to recitation class or your TA might provide other options.

Homework:

We will use web homework at the address on the system [WeBWork](#) at <https://webwork.as.uky.edu/webwork2/MA113S17/>. We will add students to the homework system until the last day to add. See the document titled [Introduction to WeBWork](#) for more information including instructions on how to log in. The document [Entering Answers in WeBWork](#) gives more information about how to enter mathematics to answer questions in WeBWork. Please contact your lecturer or teaching assistant if you have difficulty logging in or need to change sections.

The due date for each of these homework assignments is given on the corresponding web page as well as in the [course calendar](#). Occasionally, we may delay homework due dates. The due date at the WeBWork server will be the most up-to-date information.

Late web homework will not be accepted. Shortly after the homework is due, solutions to many of the web homework problems will be made available through the WeBWork server. We cannot allow some students to continue working on the problems after the solutions are available or delay providing

solutions to students who have completed the homework on time. If you have an unusual situation that prevents you from completing web homework, please contact your instructor. However, in general students will be expected to complete web homework even if they are traveling.

Suggestions for working web homework:

- Print out the web homework and write out complete solutions of problems before attempting to submit answers. These solutions will be helpful in studying for exams and to bring to discussions with others.
- Form a study group and meet regularly to discuss web homework and the material covered in lectures.
- Make sure you understand your solution to each homework problem. Discuss your approach with members of your study group, your instructor, or peer tutors at the Mathskeller or the Study.
- Do not guess. If you submit an answer and are marked wrong, look through your solution for computational and conceptual errors.
- Near the bottom of many pages at WeBWorK, you will find a link to email your instructor. Please work to formulate clear questions in your email. We will work to answer emailed questions by the next work day. Instructors will not be able to answer questions sent the evening of a due date.

Quizzes:

Quizzes will be given on most Thursdays during recitations; for the schedule see the [course calendar](#). Calculators will *not* be allowed for quizzes. The quiz grades contribute to your overall course grade as described in the grading section of this website.

Quizzes and Solutions: (Solution links will be active at some point after quiz day)

[Quiz 1 and Solution](#)

Written Assignments:

Six written assignments are to be turned in during lecture; for the due dates see the [course calendar](#).

Assignment 1	WA1.pdf	Solutions
Assignment 2	WA2.pdf	Solutions
Assignment 3	WA3.pdf	Solutions
Assignment 4	WA4.pdf	Solutions
Assignment 5	WA5.pdf	Solutions
Assignment 6	WA6.pdf	Solutions

These assignments are intended to help you learn to communicate mathematics and to present clear, well-written solutions to problems. Your solutions will be graded by humans for mathematical correctness and for clarity of exposition. Students who wish to receive full credit should write in complete, grammatically correct sentences. You should give clear reasoning and present the steps of your solution in logical order. You will want to include figures and graphs as needed to explain your reasoning.

Assignments are due at the beginning of your lecture on the due date listed in the course calendar. Late assignments will be accepted, but may lose 20% credit for each day or part of a day that the assignment is late. Please speak with your lecturer if a serious illness or family emergency prevents you from completing an assignment. Students with scheduled absences (travel or authorized university excuse) may turn in the assignment early or have another student bring the assignment to class.

Exams:

There will be three uniform midterm exams and one final exam. Each midterm exam is 120 minutes (2 hours) and the final exam is 120 minutes (2 hours). **You must bring your student identification card with you to the exams!**

If you must miss an exam due to a conflict as defined in the University Senate Rules, you may request an alternate exam. You will need to submit your request to your lecture instructor at least two weeks in advance of the scheduled date of the exam using the [MA 113 Alternate Exam Request Form](#). Information regarding alternate exam times will be emailed directly to the students requesting an alternate exam.

<i>Exam</i>	<i>Date</i>	<i>Time</i>
I	Tuesday, February 7, 2017	5:00 - 7:00 pm

II	Tuesday, March 7, 2017	5:00 - 7:00 pm
III	Tuesday, April 11, 2017	5:00 - 7:00 pm
Final Exam	Monday, May 1, 2017	8:30 - 10:30 pm

All exams are scheduled in the following rooms.

<i>Sections</i>	<i>Room</i>	<i>Building</i>
001, 002, 003, 004	CP 139	Chemistry-Physics Building
007, 008, 009	CP 153	Chemistry-Physics Building
010, 012, 013	CP 155	Chemistry-Physics Building
005, 014, 015	CP 320	Chemistry-Physics Building

Calculators:

You may use calculators on the homework and exams, but *not* on the quizzes. You may not use any machine (carbon-based life form or silicon-based) that has symbolic manipulation capabilities of any sort on any exam. This precludes the use of TI-89, TI-Nspire CAS, HP 48, TI 92, Voyage 200, Casio Classpad or laptop computer. Also, you *may not* use your mobile phone, iPhone or Blackberry on any exam even if you forget your regular calculator. If it runs Android, GEOS, iOS, Linux, MacOS, PalmOS, Ubuntu, Unix, Windows, or similar operating systems, you cannot use it on the exams. Bald answers will receive little or no credit. A bald answer is one that is simply the output of a calculator routine or a single numerical or symbolic expression that has no supporting work.

Old Exams:

A selection of exams given in MA 113 over the past several years is available in [MA 113 exam archive](#).

Review Sessions:

Review sessions for MA 113 are hosted by The Study. You can find common hour review schedules (for MA 113 and other courses)

here: <http://www.uky.edu/AE/study-peer-schedule> (you need to scroll to the bottom of the page to find the graphic with relevant information).

MA 193:

In addition to the 4 hours of credit for MA 113, the department offers one additional hour of credit as MA 193 on a pass/fail basis. You will pass MA 193 if you have no more than 2 unexcused absences during MA 113 recitations and you pass MA 113. If you fail MA 113 or have 3 or more unexcused absences in recitation, you will fail MA 193.

Your section number for MA 193 must be the same as your section number for MA 113. If you drop or change sections of MA 113, please make sure to also drop or change sections of MA 193. It is your responsibility to do this if you change sections. If you do not change the section of MA 193 you may receive a failing grade for MA 193 because you are not on the proper class roll.

Study Advice and Getting Help:

Mathematics is not a spectator sport. To understand what this means, consider how well you might learn to play football by watching Cristiano Ronaldo. You will not learn the material in this course by listening to the lectures, and thinking to yourself - "Yes, I understand that". You must also read the book and work the problems to learn. The instructor's task is that of an assistant to help you learn as much of the material as you desire. This being said, form good study skills from the start!

- Come to class and take notes during lecture.
- Read each section of the text prior to the lecture where it will be covered.
- As you read the text, have pencil and paper handy. Work through the computations. Find examples to illustrate the theorems and results in the text. If the text tells you that every differentiable function is continuous, think of examples of differentiable functions and check if they are continuous. Think of examples of functions that are not continuous and determine if they are differentiable. Can you think of an example of a function that is continuous but not differentiable?

- Begin the homework immediately after material is covered in class. Mathematics is cumulative. In order to benefit from Wednesday's lecture, you must understand the material covered on Monday.
- Find classmates and form a study group. Spend time discussing problems.
- Do **not** fall behind. It is very difficult to catch up in a math class after falling behind.
- Begin preparing for exams well in advance. Read the text again to review all of the material to be covered on the exam. Be sure you are familiar with the main results and theorems and how they are used in homework.
- Work additional problems to prepare for the exam. Use [old exams](#) from previous semesters of MA 113 to take a practice test. Treat it like a test. Compare your solutions with those provided by the answer key.
- If you are having trouble, then seek help immediately.

If you are having trouble with a homework problem, you can send an e-mail through the online homework system to your teaching assistant and lecturer. Try to provide as much information as possible in your help request. Describe what you have attempted and give a guess as to what might be wrong. Have you found an answer that is being marked wrong, or are you unable to start solving the problem?

In addition to the online help, you should take one or more of the following steps.

- Talk to your instructors before or after class or send them an email. Let them know what problems you are having, if any. They will be happy to help!
- Go to the office hours of your instructors.
- You can also seek help in the [Mathskeller](#) that is located in room CB 063 in the basement of the classroom building. Many instructors and teaching assistants from the Department of Mathematics will hold office hours in the Mathskeller. In addition, limited drop-in tutoring is available. You can seek help from any of the instructors or teaching assistants --- not just your own. The Mathskeller is open from 9 am to 5 pm Monday through Friday (except academic holidays) during the semester.
- Furthermore, you can seek help in [The Study](#) . Academic Enhancement provides drop-in peer tutoring by undergraduate students who have successfully navigated the courses for which they tutor. A regular schedule of all tutoring is available on [The Study's web site](#). You can also call 257-1356.

You can find more detailed suggestions of how to study for the course [here](#).

Policies

- *Attendance.* Attend lectures and recitations regularly. Be on time and remain until dismissed. Do not leave in the middle of class. Instructors have the right to take off attendance points for coming late or leaving early. If you cannot come to lecture or recitation and would like to request an excused absence, inform the instructor as early as possible and provide documentation.
- *Excused absences.* Students need to notify the instructor of absences prior to class when possible. Senate Rules 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor. Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, http://www.uky.edu/Ombud/ForStudents_ExcusedAbsences.php).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused) per University policy. Per Senate Rule 5.2.4.2, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The professor must give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

- *Verification of absences.* Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request “appropriate verification” when students claim an excused absence because of illness, or death in the family. Appropriate notification of absences due

to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.

- Electronic devices such as mobile phones, laptops and tablets should be put away or used only as part of class activities during lectures and recitations. Instructors may prohibit their use during class. Students who are not participating in class may be marked absent. Mobile phones, laptops, and computers may not be used during exams.
- Classes meet as usual on the days after an exam. Attendance rules apply as usual.
- *Students with disabilities.* If you have a documented disability that requires academic accommodations, please see your instructor as soon as possible. In order to receive accommodations in this course, you must provide your instructor with a Letter of Accommodation from [the Disability Resource Center](#). The Disability Resource Center coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at drc@uky.edu. Their web address is <http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/>.
- In order to be fair to all students, dates for exams and homework assignments are firm. It is very important to take each exam on schedule. Missed work may be made up only due to illness with medical documentation or for other unusual (documented) circumstances. If you have a university excused absence or a university-scheduled class conflict with uniform examinations please contact your lecturer as soon as possible, **but at least two weeks before the exam**, so that an alternate exam can be arranged for you.
- *University Policy on Academic Integrity.* Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed. Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the website [Ombud](#). A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be

properly credited. Senate Rules 6.3.1 (see [Senate Rules](#) for the current set of Senate Rules) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission. When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Students are encouraged to work together to understand a problem and to develop a solution. However, the solution you submit for credit must be your own work. In particular, you should prepare your solutions to the written assignments independently and you should submit your answers for web homework. Copying on exams and usage of books, notes, or communication devices during examinations is not allowed. Cheating or plagiarism is a serious offense, and it will not be tolerated. Students are responsible for knowing the [University policy on academic dishonesty](#).

- *Mid-term Grades*. Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (<http://www.uky.edu/registrar/calendar>).

- All requests for corrections to grading should be addressed to your lecturer. Requests should be made shortly after you receive the paper back and must be made within one day of the paper being returned.
- Math is more than just manipulation. To earn top grade on exam problems and written assignments it is not enough to have the correct answer, but you must also show the correct reasoning.

This course is coordinated by [Benjamin Braun](#). Comments or corrections related to this web page may be sent to benjamin.braun@uky.edu.