

**Math 4143/5043: Advanced Calculus I**  
**Fall 2014**

**Instructor:** Dr. Michael Oehrtman  
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405-744-5790  
MSCS 426

**Office Hours:** M 12:30 pm – 1:30 pm  
W 2:30 pm – 3:30 pm  
F: 1:30 pm – 2:30 pm  
or by appointment

**Class Times:** MWF 10:30 pm – 11:20 pm

**Location:** MSCS 422

**Website:** <https://oc.okstate.edu> (then log in and find our course)

**Prerequisites:** C or better in MATH 3013 and 4023

**Required Text:** *Real Mathematical Analysis*, by Charles Chapman Pugh

**Course Description:** This course develops the content of calculus through rigorous definition and proof. We will review the content in Chapter 1 in the text then cover Chapters 2-4 extensively. We may diverge from the occasionally to cover slightly different material or the same content from a different perspective. Learning to read and understand rigorous mathematics and to generate proofs requires significant effort that is different in nature from what was required to succeed in most mathematics classes you have previously taken. Consequently, much of our class time will involve your work in groups and presentations of problems and proofs at the board. I will also expect the class to take responsibility for assessing the integrity of these arguments.

**Class Participation and Presentations:** I expect everyone in the class to contribute constructively to the class and group discussions. This can take several forms from clearly articulating points of confusion to uncovering problems with previous lines of reasoning to providing key ideas and breakthroughs. If your entire group is stuck and/or confused (there is something wrong if this doesn't happen on a regular basis, by the way), you should not give up and wait for me to come around, but you should be resourceful in trying to find new ways to attack the problem or on uncovering what is wrong with your previous attempts. You should also look for ways to draw other students into the conversation, since much of what you need to learn is how to listen and evaluate mathematical reasoning. You are not participating fully if you are at either extreme: either never talking or doing all of the talking. Throughout the semester, you should aim to make 5 presentations to the class about key ideas in definitions, proofs, or examples that I identify.

**Reading and Definitions:** Reading assignments from the textbook will also be posted on the homework page. In order to understand what is being discussed in class you must have read the assigned material BEFORE coming to class. Reading terse and rigorous mathematical text often requires several passes and an active effort to look up definitions, sketch diagrams, reflect on counterexamples, etc. I view one of the main objectives of this class as helping you to become good at reading and writing rigorous mathematics, but doing so will require time and practice on your part. You should not get discouraged if you experience significant confusion and frustration at times in this process since that is normal, and I will do all I can to help you overcome this. The first and perhaps most important step is for you to learn precise definitions and be able to state them without error and to learn to focus on the definitions of the terms in any statement you are trying to understand, prove, or disprove. Getting a definition "close" (but not exact) or

focusing only on intuitive interpretations of terms can lead to completely incorrect reasoning, proofs, and results.

**Homework:** You should allot significant time to spend on the homework for this class well in advance of the due date. Very few students will be able to earn much credit on an assignment worked just a day or two before it is due. You should also seek help in office hours well before the day an assignment is due, since it will take time to solidify and apply the ideas you take away from our discussions. The best way to ensure that you are developing the appropriate insights and on the right track is to talk to other students about the problems. I encourage you to work together, but each student must write up his/her solutions in his/her own words. All assignments and due-dates will be posted on the homework page of the class website, and you are responsible for keeping track of them. If you forget to bring your homework to class, you may submit it up to 24 hours later with a 20% penalty. No homework will be accepted later than this under any circumstances. I will drop your two lowest two homework scores. Type or write all of your work LEGIBLY on 8½"×11" paper with at least ONE-INCH margins on all sides free of writing except your name, date, and assignment number, and STAPLE all pages together. In general, assigned questions will require significant depth in your responses. In order to earn an A or B for the course, I anticipate that most people will need to spend *8 to 9 hours per week* outside of class on homework, reading, and studying. If you are struggling in the class, you should discuss your situation with me immediately and will need to devote more time to studying each week.

**Exams:** I will give three exams, one over each of Chapters 1-3 in class throughout the semester. Before each exam, I will provide an overview of what will be covered.

**Final:** The final exam will be comprehensive and administered at the officially scheduled time, **Wednesday, December 10 from 10:00am - 11:50am**. Requests to take the final examination at a time other than the published time will not be granted except in cases of conflict with the scheduled exam time for another course, having three or more exams scheduled in one day, personal emergencies, or for reasons of religious practice. In particular, nonrefundable plane tickets, weddings, work schedules, and the like are not acceptable reasons for rescheduling final examinations. Please keep this policy in mind when making end-of-semester plans. You must tell me in writing by Monday, November 24, if you have a university-approved conflict with the final exam time.

**Grades:** Course grades will be determined as follows:

	<u>Points</u>	<u>Grade</u>	<u>Points earned</u>
Homework	350	A	900-1000
Chapter 1 Exam	100	B	800-899
Chapter 2 Exam	150	C	700-799
Chapter 3 Exam	150	D	600-699
Final	250	F	0-599
<b>Total Possible</b>	<b>1000</b>		

I will replace up to two chapter exam % grades with your final % grade (that is, scaled appropriately) if that improves your grade. I reserve the right to use discretion if you are on the borderline between two grades, considering performance on the final exam, improvement or decline during the semester, attendance, and my subjective judgment of your effort.

**Portable Electronic Devices:** Please extend courtesy to your instructor and fellow students by turning your portable electronic devices to silent or vibrate, and putting them away in your bag during class. If you know that you may need to accept an emergency phone call during class or if you have children in childcare or school, please let me know in advance. If you need to take a phone call during class, please step out of the classroom while you place and complete your call.

**Academic Honesty:** Don't cheat. Don't copy off of other students, allow other students to copy your work, or present work you find in printed or electronic sources as your own. I encourage you to form study groups. Try the homework yourself, and then get together with a study group to go over questions, and to study for tests. You will learn a great deal from articulating your questions and explaining material to your peers. Discussion of assigned homework is encouraged, but you should be sure you fully understand the material by writing your solutions on your own. In this class, copying on quizzes or exams or allowing someone to copy off of you may result in an F! for the course. Copying or allowing someone to copy your work on homework carries a penalty of up to 10 percentage points off your semester homework grade in the first instance and an F! in the class in a second instance. For questions, contact the Office of Academic Affairs, 101 Whitehurst, (405) 744-5627, <http://academicintegrity.okstate.edu>. I deal with cheating very harshly; don't take any chances.

**What if I need help?** You have lots of resources for this course. Often students find it helpful to talk to each other and work through homework or practice problems together. You're encouraged to post questions and answers in the Discussion section of the Online Classroom. For quick questions, you can send me e-mail if you're really too shy to post there, and you should certainly come see me in person during office hours if you have something more than a quick question. Above all, see me early if you have questions. Good luck.

**Syllabus Attachment:** Please read the OSU syllabus attachment, linked on the web at <http://academicaffairs.okstate.edu/faculty-a-staff>. This has a lot of important information, including instructions about disability accommodations. Please contact me privately during the first week of the course if you need accommodations as a result of a disability.