

MAA4102 Intro. Real Analysis 1

MAA 5104 Advanced Calculus 1

Spring 2024

Section Information

MWF 3 TURL

Course Instructor: Carol Demas

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Office Hrs: TBA

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Course Overview. This course covers calculus concepts including real numbers, sequences, functions, limits, continuity, and differentiation, placing a strong emphasis on theoretical understanding. Students will refine their mathematical reasoning and gain proficiency in constructing proofs and connecting concepts.

Course objectives and/or goals: A key objective of the course is to enable students to articulate mathematical ideas precisely and communicate them with clarity. By the end of the course students will gain proficiency with the following:

1. Proof techniques, Ordered Fields, Properties of real numbers, Fibonacci sequence
2. Sequence Convergence, Limits, Monotone and Cauchy sequences, Subsequences
3. Limits of Functions
4. Continuity and properties, Discontinuity, and Uniform Continuity of Functions
5. Differentiation of functions, Properties of differentiable functions, Mean Value Theorem, Higher Order Derivatives, and L'Hopital's Rule.

Canvas Messages: Check your messages **daily** so that you do not miss any important announcements.

Text: Witold A. J. Kosmala, A Friendly Introduction to Analysis, second edition, Pearson Prentice Hall, Upper Saddle River, NJ 07458.

Time commitment: University students are expected to spend at least 3 hours for each in-class hour to keep up with the course material.

Content: We will cover some of Chapters 1(Introduction), 2(Sequences), 3(Limits), 4 (Continuity), and 5(Differentiation).

Homework: Doing homework is essential to success in this course and is one of the best ways to prepare for exams. Homework is worth 10% of the grade. The lowest score is dropped. Homework is collected on exam days. Late submissions are not permitted.

Class participation is worth 10% of the grade. You must be present to earn participation points. The lowest two scores are dropped.

Exams: Four exams will be given on the dates shown in the calendar. Each is worth 17.5% of your grade. The fourth exam replaces any previously missed exam score.

Quizzes: Five short closed-book in-class quizzes based on assigned homework problems totalling 10% of your grade will be given on the dates shown in the calendar. The lowest quiz score is dropped.

Grades: The letter grade will be awarded with Canvas rounding up the display grade (i.e. 89.5 counts as A) as follows:

A	90%-100%	C	70%-74%
A-	87%-89%	C-*	67%-69%
B+	85%-86%	D+	64%-66%
B	80%-84%	D	60%-63%
B-	77%-79%	D-	57%-59%
C+	75%-76%	E	0-56%

If you have a grade dispute, please resolve it with your instructor **within a week** of the assignment deadline.

Your grade is comprised of the following:

4 Exams 17.5% each
Participation 10% (drop lowest two scores)
Homework 10% (drop lowest score)
Quizzes 10% (drop lowest score)

Total: 100%

UF grading policies can be found here.

Accommodations for students with learning disabilities: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting here.

Academic Honesty: The course will be conducted in accord with the University honor code and academic honesty policy which can be found at www.dso.ufl.edu/sccr/honorcodes/honorcode.php. The Mathematics Department expects you to follow the Student Honor Code. We are bound by university policy to report any instance of suspected cheating to the proper authorities.

In addition, we remind you that lectures and the lecture notes given in this class are the property of the University/faculty member and may not be taped/shared without prior permission from the lecturer and may not be used for any commercial purpose. Students found to be in violation may be subject to discipline under the Student Conduct Code. Click here to read the conduct code.

Participation: Participation comprises 10% of your grade. Most days attendance will be taken and some days there will be activities. There are two drops for participation scores. If you miss a day with valid documentation, it will not count against you. Valid documentation

includes documented illness, school-sponsored activity, death in the immediate family, court-ordered or military appointments, and religious holidays. Scheduled flights do not count as valid documentation so do not make plans for a flight which conflicts with course times. UF attendance policies can be found here.

Makeup Exams: If you miss an exam with valid documentation, exam 4 will replace it. If you miss without valid documentation, there will be a 20% penalty for its replacement. Valid documentation includes documented illness, school-sponsored activity, death in the immediate family, court-ordered or military appointments, and religious holidays. Scheduled flights do not count as valid documentation so do not make plans for a flight which conflicts with exam dates and times. UF makeup policies can be found here.

Makeup Quizzes: If you miss a quiz with valid documentation, a makeup quiz on April 24 will replace it. If you miss without valid documentation, there will be a 20% penalty for its replacement. Valid documentation includes documented illness, school-sponsored activity, death in the immediate family, court-ordered or military appointments, and religious holidays. Scheduled flights do not count as valid documentation so do not make plans for a flight which conflicts with exam dates and times. UF makeup policies can be found here.

Late submissions will not be accepted but the lowest homework score is dropped.

Evaluations: Course evaluations are now at <https://gatorevals.ua.ufl.edu/>

Privacy: Our class sessions, including office hours, may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded.

If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared.

As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Diversity: The Mathematics Department is committed to diversity and inclusion of all students. We acknowledge, respect, and value the diverse nature, background and perspective of students and believe that it furthers academic achievements. It is our intent to present materials and activities that are respectful of diversity: race, color, creed, gender, gender identity, sexual orientation, age, religious status, national origin, ethnicity, disability, socioeconomic status, and any other distinguishing qualities.

Exam Coverage

Exam 1 covers 1.3, 1.4, 1.7, 1.8, and 1.10 (Fibonacci)

Exam 2 covers 2.1-2.6

Exam 3 covers 3.1-3.3 and 4.1-4.4

Exam 4 covers 5.1-5.5

Tentative Homework Schedule

Section 1.3: 2 a,c, f,i,l,o,r,f,u, 3,4a-d 5a;

Section 1.4: 1, 2, 4, 5;

Section 1.7: 1, 2, 3, 5, 11

Section 1.8: 13-15, 18-20;

Section 1.10: 1,3,4,5,7

Section 2.1: 2,3, 5, 7, 10, 12, 14--17, 19--21;

Section 2.2: 3, 5, 8, 11, 15--17, 19, 21;

Section 2.3: 2, 3, 5, 7, 10, 11, 14, 16;

Section 2.4: 4--7, 9, 11, 13, 16, 17;

Section 2.5: 2, 3, 5--7, 11, 13, 15, 17--19;

Section 2.6: 2, 4, 5, 7, 9;

Section 3.1: 4, 5, 7, 8, 10, 11, 15;

Section 3.2: 1, 3, 8, 9, 13, 15;

Section 3.3: 4, 5, 8, 9, 10, 12, 13, 15;

Section 4.1: 1, 2, 3, 5, 6, 9, 10;

Section 4.2: 1, 2;

Section 4.3: 1, 3, 7, 13, 14, 17, 18;

Section 4.4: 1, 2, 5, 10, 12, 13;

Section 5.1: 2, 3, 6, 7, 9--12, 15;

Section 5.2: 1, 3, 6, 7, 12, 13;

Section 5.3: 1, 2, 4, 6, 7, 9--11, 15, 17, 19, 21, 27, 29;

Section 5.4: 2, 5, 8--10, 21--23, 27, 29, 30;

Section 5.5: 1, 5, 6, 8, 11, 13;

Tentative schedule (subject to possible revision)

Mon	Tues	Wed	Thur	Fri
Jan8		10		12
L1 1.3		L2 1.4		Review
15		17		19
holiday		L3 1.7		L3 1.7
22		24		26
L4 1.8 Review		L5 1.10 Quiz 1		L6 2.1
29		31		Feb2
Review		Exam 1 HW1 due		L7 2.2
5		7		9
L8 2.3		L9 2.4		Review
12		14		16
L10 2.5		L11 2.6 Quiz 2		Review
19		21		23
Exam 2 HW2 due		L12 3.1		L13 3.2
26		28		Mar1
Review		L14 3.3		L15 4.1
4 L16 4.2		6 Review Quiz 3		8 L178 4.3 HW3 due
11		13		15
break		break		break
18		20		22
Review		L189 4.4		Review
25		27		29
L19 5.1		L19 5.1 Quiz 4		Review
Apr1 Exam 3 HW4 due		3 L20 5.2		5 L21 5.3
8		10		12
Review		L22 5.4		Review
15		17		19
L23 5.5 Quiz 5		Review		Exam 4 HW CH5 due
22		24		
The number e		Makeup Quizzes		

Tentative Weekly Schedule

Week	Topics	Assignments		
		HW	Quiz	Exam
1	Induction, Proof Techniques			
2	Ordered Field and Real Number System			
3	Some Properties of a Real Number, Fibonacci Numbers		Quiz 1	
4	Convergence, Limit Theorems	HW CH1 due		Exam 1
5	Infinite Limits, Monotone Sequences			
6	Cauchy Sequences, Subsequences		Quiz 2	
7	Review, Limits at Infinity	HW CH2 due		Exam 2
8	Limit at a Real Number, Sided Limits		Quiz 3	
9	Continuity of a Function, Discontinuity	HW CH3 due		
10	Properties of Continuous Functions, Uniform Continuity			
11	Derivative of a Function, Review	HW CH4 due		Exam 3
12	Properties of Differentiable Functions, Mean Value Theorem			
13	Higher Order Derivatives, Review			
14	L'Hopital's Rule, Review	HW CH5 due	Quiz 5	Exam 4
15	The number e , Quiz makeups			

Campus Resources:

Health and Wellness U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services. **Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

Academic Resources E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu. Student Health Care Center website.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420.

General study skills and tutoring. Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.