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# Advanced Calculus II S22

## MAA 4212: Advanced Calculus II

University of Florida, Spring 2022

Little Hall 223, MWF3 (9:35–10:25)

### Instructor information:

[Vince Vatter](#)

Office: Little Hall 412

Office hours:

- Monday 1:30–2:20 in-person in LIT 412,
- Tuesday 5th period (11:45–12:35) on Zoom, and
- by appointment

Office phone: (352) 294-2338

Email: [vatter@ufl.edu](mailto:vatter@ufl.edu)

## Tentative schedule

Lecture number	Date	Topics
1	Wednesday 1/5	Metric spaces Section 1.1
2	Friday 1/7	Normed vector spaces Section 1.2
3	Monday 1/10	Convergence and limits Section 1.3
4	Wednesday 1/12	Open and closed sets Section 1.4
		<b>Homework 1 due</b> (before class)

Theory I F18	5	Friday 1/14	Interior, exterior, boundary, and closure Section 1.5
Abstract Algebra S17	6	Monday 1/17	<i>Martin Luther King Jr. Day (no class)</i>
		Wednesday 1/19	Relative topology Section 1.6
Linear Algebra S16	7	Friday 1/21	Cauchy sequences and completeness Section 1.7
		8	Monday 1/24
Linear Algebra F15	9	Wednesday 1/26	<b>Quiz 1</b> (during class)
		Friday 1/28	Closed and bounded sets Section 2.2
Combinatorics II S15	10	Monday 1/31	Sequential compactness Section 2.3
		11	Wednesday 2/2
Topics in Combinatorics F15	12	Friday 2/4	Continuity Section 3.1
		13	Monday 2/7
Combinatorics F14	14	Wednesday 2/9	<b>Quiz 2</b> (during class)
		Friday 2/11	Continuity and compactness Section 3.3
Linear Algebra F14	15	Monday 2/14	Uniform continuity and compactness Section 3.4
		16	Wednesday 2/16
Differential Equations S13	17	Friday 2/18	Types of convergence of functions Section 4.1
		18	Monday 2/21
	19	Wednesday 2/23	<b>Quiz 3</b> (during class)
		Friday 2/25	The uniform metric Section 4.3
	20	Monday 2/28	Uniform convergence and differentiation Section 4.4
		21	Wednesday 3/2
	22	Friday 3/4	Power series

		tba
		<i>Spring Break</i>
23	Monday 3/14	Power series tba
24	Wednesday 3/16	Power series tba
25	Friday 3/18	Linear transformations Section 6.1
26	Monday 3/21	The equivalence of norms Section 6.2
	Wednesday 3/23	<b>Quiz 4</b> (during class)
27	Friday 3/25	The metric space of linear transformations Section 6.3
28	Monday 3/28	Invertible matrices Section 6.4
29	Wednesday 3/30	The derivative (for multivariable functions) Section 7.1 <b>Homework 5 due</b> (before class)
30	Friday 4/1	Directional and partial derivatives Section 7.2
31	Monday 4/4	The chain rule Section 7.3
	Wednesday 4/6	<b>Quiz 5</b> (during class)
32	Friday 4/8	The contraction mapping theorem Section 7.4
33	Monday 4/11	Continuous differentiability Section 7.5
34	Wednesday 4/13	The inverse function theorem Section 7.6 <b>Homework 6 due</b> (before class)
35	Friday 4/15	The implicit function theorem
36	Monday 4/18	tba
	Wednesday 4/20	<b>Quiz 6</b> (and last day of class)

## Text

There is no required text. Course notes will be provided on Canvas.

## Course content

From the [course catalog](#) : Continues the advanced calculus sequence in limits, differentiation, integration and series.

In addition to mastery of the course content, course objectives include reading, writing, and discovering proofs and constructing proofs and counterexamples in analysis.

## Expectations and grading rubric

Work submitted for a grade in this course will be graded in a most rigorous fashion, and thusly, such work should have a good deal of thought and care put into it.

Most of the work required in this course will consist of writing proofs. These proofs will be assigned scores of 0–4 points based on the following guidelines.

### **0 points.**

The work contains no original steps toward a correct solution. This includes work that simply consists of relevant definitions or theorems without interpretation.

### **1 point.**

The work contains some original steps toward a correct solution but does not contain a workable outline of the full solution. This grade is also used if the student has misunderstood the question or made an unwarranted simplifying assumption that makes the problem trivial.

### **2 points.**

The work contains an outline of a correct solution and several steps toward this solution. However, the writing may be unclear, or there may be holes in the argument.

### **3 points.**

The work resembles a full, complete proof, but it has some serious deficiencies. These may include incomplete sentences, abbreviating words with logical symbols such as those for “for all” or “implies”, imprecise definitions, or overlooking trivial cases. In general this grade is reserved for work which would receive 4 points with minor revision.

### **4 points.**

The work consists of a full, complete proof and is reasonably well written in complete sentences, without logical symbols. There may be minor typos or clumsy writing that could be improved, but no important steps of the solution are omitted or incorrect.

## Evaluation

There will be 6 quizzes and 6 homework assignments throughout the semester, as indicated in the schedule.

Quizzes and homework will be collected online, via Canvas. Both are open-book and open-note. Late assignments will not be accepted except by prior agreement.

All assignments will count equally toward your grade.

Final letter grades will be assigned on a curve, which will be no tougher than the 10-point scale: 90%–100% will be some form of A, 80–90% will be at least some form of B, etc.

If you have a disagreement with the grading of one of your solutions, I ask that you submit a

written request for reconsideration within one month.

Grading will be in accordance with the UF policy stated at

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

## Honor code

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: **“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”**

The [Honor Code](#) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

## Class attendance

Attendance is strongly encouraged but is not a component of grades.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

## Accommodations for students with disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc/> ) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

## Online evaluations

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at

<https://gatorevals.ua.ufl.edu/>.

## Complaints

The official UF policy for filing a complaint about the course may be found [here](#) .

## Counseling and Wellness Center

<https://counseling.ufl.edu/>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

## U Matter, We Care

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.



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