Syllabus. Title of Course:

**Analysis I**

*MATH:6200:0001*  
*Prerequisites:* MATH:5210, or equivalent  
3 s.h.

Start and end times: 2:30P - 3:20P MWF 113 MLH

Instructor: Palle Jorgensen  
Department of Mathematics: [https://math.uiowa.edu/](https://math.uiowa.edu/)

Course ICON site: To access the course site, log into Iowa Courses Online (ICON)  
[https://icon.uiowa.edu/index.shtml](https://icon.uiowa.edu/index.shtml) using your Hawk ID and password.

Course Home  
The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the policies and procedures for its courses. Graduate students, however, must adhere to the academic deadlines set by the Graduate College.

Instructor: Palle Jorgensen  
palle-jorgensen@uiowa.edu or MLH 25B.  
Contact info. Office location and office hours/ Student drop-in hours: 25B MLH, hours 11:30-12:30 MWF, or by appointment. Just ask. We can also meet in the Muhly-Lounge room 3, down the hall in MLH from the Math office. Phone or E-mail me: office # 335-0782

DEO Contact information: Professor Ryan Kinser, 14 MLH, ryan-kinser@uiowa.edu

Description of Course, two semester sequence.  
**Description.**  
Analysis I. The importance of the course-subject is now growing within core mathematics, and recent years have witnessed an explosion in diverse applications to neighboring areas. Further note that Analysis I typically serves as a bridge from your standard courses into a diverse list of research topics; research areas you are moving into, thesis planning, even in other courses, and exploring.

**Objectives and Goals.** The *mathematics course catalogue* is terse and does include important facts for this course, as well as for others. The course sequence Analysis I & II together covers many areas in both pure and applied math, including harmonic analysis, as well as key tools in real & complex variables, operator theory, PDE, geometry, topics from probability theory, and math physics. Most grad students are ready to take the course early. Best not postpone it. Ask me if you are worried about prerequisites. In summary, Analysis I offers a sound foundation for
multiple and diverse areas, including stuff from other courses in math., different from analysis itself.

**Connections** will be made during the semester from analysis to the other areas of mathematics, as well as to applications outside math.

In lectures, we follow the book by W. Rudin: **Textbooks and Resources. Title: Real & Complex Analysis** *(edition: 3rd)* Required ISBN: 9780070542341
Author: Walter Rudin
Publisher: McGraw-Hill ©1987
*Available at:* [Iowa Hawk Shop](#)

Other material (books papers etc) will be discussed during the semester, and details will follow.

**Academic Honesty and Misconduct**
All students in CLAS courses are expected to abide by the [CLAS Code of Academic Honesty](#).
Undergraduate academic misconduct must be reported by instructors to CLAS according to [these procedures](#). Graduate academic misconduct must be reported to the Graduate College according to Section F of the [Graduate College Manual](#).

**Student Collaboration:**
The homework for this course is designed to help you master your knowledge related to the topics covered during lecture. As such, you may work on the homework problems and other assignments with others or use online resources. However, please be aware that to master the skills needed for this class, practice is required and that to do well on the final exam you will need to work many of these problems multiple times without help. Be sure to test your knowledge by doing much of the homework on your own. Even if you collaborate with your colleagues when solving the homework problems, I strongly encourage you not to copy, mot-a-mot, the solutions from others but instead try to write them in your own understanding. This is an excellent exercise proven to help students with their material comprehension.

**Student Complaints**
Students with a complaint about a grade or a related matter should first discuss the situation with the instructor and/or the course supervisor (if applicable), and finally with the Director or Chair of the school, department, or program offering the course.

**Drop Deadline for this Course**
You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the drop deadline for this course here. When you drop a course, a “W” will appear on your transcript. The mark of “W” is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the Registrar’s website. Undergraduate students can find policies on dropping and withdrawing here. Graduate students should adhere to the academic deadlines and policies set by the Graduate College.

**Grading System.**
I will not use a +/- grading system. Final course grade will be assessed based on your performance in the following activities:

Homework: 30% - on 13 assignments.

Midterm I: 20% - on 9/27, in class.

Midterm II: 20% - on 11/1, in class.

Final: 30% - TBD

As the class progresses, all grades will be recorded on ICON.

**Letter grades to point scores:**

A. 85-100.

B. 75-84.

C. 65-74.

D. 55-64.

F. less than 55.

**Calendar of Course Assignments and Exams.**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>August 21</td>
<td>Opening of Classes.</td>
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<tr>
<td>September 4</td>
<td>Labor Day - University Holiday--No Classes; Offices Closed</td>
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<tr>
<td>November 19 - 26</td>
<td>Fall Break</td>
</tr>
<tr>
<td>November 23 - 24</td>
<td>University Holidays, Offices Closed</td>
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<tr>
<td>November 27</td>
<td>Classes resume</td>
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<tr>
<td>December 8</td>
<td>Close of Classes</td>
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December 11 - 16 Final Examination Week.

**Course plan, week for week: TENTATIVE TIMETABLE.**

We will go slow in the beginning, and then speed up from there.

The weekly Homework assignments will be Wednesdays, starting August 30, problems selected from the particular chapter, covered the week before each assignment; see below.

**Rudin’s Real and Complex, 3rd ed, for both I & II; covering the first 9 chapters:**

We follow chapter/section for section,

Week1: ch1 up to page 15.
Week2: ch1, up to page 19.
Week3: ch 1, last third of ch 1. There will be supplements.
Week4: ch 2, up to page 40.
Week5: ch 2, up to page 49.
Mid Term Exam 1: Wed of the 6th week, Sept 20.
Week6: ch 2, remaining material in ch 2
Week7: ch 3, up to page 65.
Week8: ch 3, last half of ch 3.
Week9: ch4, basics of Hilbert space.
Week10: ch 4, applications of Hilbert space.
Week11: ch 5, basics on Banach space, and applications.
Mid Term Exam 2: Wed of the 11th week, Nov 8.
Week12: ch6, complex measures & Selected topics & applications.
Week13: ch 7, differentiability and applications.
Week14: ch 8, product space, and applications.

Final exam will be comprehensive. Exam Week

December 11 - 16 Details to follow.
**Course attendance:** Attendance is expected for each class meeting, as it will help you better understand the concepts covered in lectures. If you miss a class, you are responsible for any assignments/announcements made/material covered.

**Participation in class discussions:** I strongly encourage you to actively participate in class discussions; ask questions or ask for more explanations whenever you feel confused; in this class there is NO stupid question! Also, as a general rule, for each lecture you should spend at least two hours on reading/homework/repeating the material, etc. You should start working over the homework problems right after the relevant sections are covered. If you encounter any difficulties, I strongly recommend you seek help immediately! Don't postpone it until one day before the exam! You are also encouraged to make presentations in class. Talk to me!

**Assignments:** There will be weekly homework (due on Wednesdays) assigned primarily of problems from the book and other problems of my choosing. As the semester progresses, the assignments are announced during the lecture time, and will be also posted on ICON. The lowest homework score will be dropped. Solutions for the homework problems will be posted on the ICON. No late homework will be accepted unless extraordinary circumstances are encountered. The HW should be submitted typed in Latex (or similar). For example, you could use Overleaf to generate it—-is fairly easy to use and there is a pretty good option free of charge. Keep in mind that learning Latex as early as possible is an excellent skill which will serve you well throughout your career as a mathematician (or any other type of scientist). In any case, the HW you turn in should look neat and professional. The following guidelines should be followed:

- typed on an 8.5x11 inch white paper using black ink.
- stapled. (There is no stapler in the classroom.)
- The problems must be answered linearly in the order they are assigned.
- It should look neat with, with space left between margins and in the margins.
- Your solutions should clearly indicate your reasoning, credit will not be given if you do not show your work.
- The problems statements must appear on your HW directly before your solutions. You do not need to write the problems word by word, but it should be clear enough so someone can understand the problems without having to consult the book.

**Date and Time of the Final Exam**
TBD
College of Liberal Arts and Sciences (CLAS) Course Policies

**Attendance and Absences**

*Course attendance:* Attendance is expected for each class meeting, as it will help you better understand the concepts covered in lectures. If you miss a class, you are responsible for any assignments/announcements made/material covered.

University regulations require that students be allowed to make up examinations which have been missed due to illness or other unavoidable circumstances (e.g., involvement in other UI authorized activities or sports, etc). So, students that missed an exam or assignment due to any of these reasons must notify the instructor immediately. They are also strongly encouraged to use the CLAS absence form on ICON under the Student Tools.

Students with mandatory religious obligations or UI authorized activities must discuss their absences with me as soon as possible. Religious obligations must be communicated within the first three weeks of classes.

**Exam Policies**

*Communication: UI Email*

Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community.

**Other Expectations of Student Performance**

*Cell phones policy:* I am expecting you to NOT use your cell phones, i-pads, or computers during the lecture time for other purposes than class related.

*Changing grade policy:* If I change your grade on a homework or exam you should always remind me in the same day by e-mail that I have changed your grade.

**Where to Get Help**

Students will find the following resources useful for this course:

*Writing Center:* [http://www.uiowa.edu/~writingc/](http://www.uiowa.edu/~writingc/)

*Speaking Center:* [http://clas.uiowa.edu/rhetoric/for-students/speaking-center](http://clas.uiowa.edu/rhetoric/for-students/speaking-center)

**University Policies**

*Accommodations for Students with Disabilities*
*BASIC NEEDS AND SUPPORT FOR STUDENTS*
*Classroom Expectations*
*Exam Make-up Owing to Absence*
Free Speech and Expression
Mental Health
Military Service Obligations
Non-discrimination
Religious Holy Days
Sexual Harassment/Misconduct and Supportive Measures
Sharing of Class Recordings