

# PHSX 566: Mathematical Physics I

Fall, 2022

**Instructor:** Charles Kankelborg (kankel AT the university domain)

**Text:** *Mathematical Methods for Physics and Engineering*  
by Riley, Hobson and Bence (Cambridge, 3rd ed.)

**Lectures:** T, Th 12:15-1:30 pm

**Office:** EPS 260C, x7853

**Office hours:** Per [posted schedule](#), or by appointment

**Grader:** Changsun Choi (changsunchoi AT the university domain)

## Description

In this course, we will encounter a selection of mathematical methods applicable to physics. A common synonym is theoretical physics, but I am primarily an experimentalist. It should not surprise you that mathematical physics is essential to experiment design and data analysis. The character of our textbook is more practical than formal, and it is quite readable.

We will not cover the entire text. Instead we will focus on a representative list of topics, explore their connections, and spend enough time in each area to develop confidence.

## Grading

Homework assignments, worth 10 points each, may be turned in physically in class or to your grader's mailbox in the Physics office. Be sure to write your name, PHSX 566, and Homework #xx clearly, because our grader has more than one class to think about. Late homework will be assessed a 1 point penalty. Late homework will not be accepted after the day of our last lecture (Thursday, December 8).

The balance of your grade will be determined by two take home exams: one midterm and one final, worth 50 and 100 points, respectively. Dates and times are TBD.

## Useful references

I have placed the following paper materials on reserve in the Library.

- Bracewell, *The Fourier Transform and its Applications*
- Arfken & Weber, *Mathematical Methods for Physicists*

In addition, the following are available electronically:

- *NIST Digital Library of Mathematical Functions*,  
<https://dlmf.nist.gov>

- Abramowitz & Stegun, *Handbook of Mathematical Functions*,  
<https://babel.hathitrust.org/cgi/pt?id=osu.32435030295133&view=1up&seq=3&skin=2021>
- Gradshteyn & Ryzhik, *Table of Integrals, Series, and Products*,  
<https://ebookcentral.proquest.com/lib/montana/detail.action?docID=405421&pq-origsite=primo>