

# MATH 3150 Section 3: Partial Differential Equations for Engineering Students Spring 2019

**Instructor:** Timo Heister ([heister@math.utah.edu](mailto:heister@math.utah.edu))

**Homepage:** <http://www.sci.utah.edu/~heister/>

**Office:** WEB 3608

**Office Hours:** TBA (see homepage for updates to my office hours).

**Class Time and Location:** MWF 11:50 - 12:40 in WEB 2250

**Course Information:** This is a 2-credit course.

## **Course Description:**

Fourier series and boundary-value problems for the wave, heat, and Laplace equations, separation of variables in rectangular and radial geometries, Fourier transform.

## **Learning objectives:**

Upon successful completion of this course, a student should be able to:

- understand and practice modeling of classical physics problems leading to partial differential equations (PDE)
- identify and classify spatial and temporal PDE
- represent functions via Fourier series representations, and understand concepts related to convergence
- use separation-of-variables methods to solve PDEs over tensorial domains
- understand and use Fourier transforms for PDEs on infinite domains

## **Prerequisites:**

ODE and linear algebra (MATH 2250, or MATH 2270 and MATH2280), and multivariable calculus (MATH 2210 or MATH 1260 or MATH 1280 or MATH 1321).

## **Text:**

Applied Partial Differential Equations with Fourier Series Boundary Value Problems (5th edition), Richard Haberman, Pearson, 2019, ISBN 9780134995434. We will be using chapters 1-4 and 10 of this text.

## **Homework:**

Problem sets will be announced in-class and subsequently posted on the course website. Homework will be divided into weekly assignments and collected in-class on Wednesdays. Only paper (hard) copies of assignments will be accepted; electronic copies will not be accepted. Late assignments of any form will not be accepted without either prior

approval from the instructor, or if a student provides documentation showing extenuating circumstances.

Each homework assignment is worth equal weight, and over the course of the semester, your lowest homework score will be dropped.

**Quizzes:**

Each week on Wednesday in-class, a short 5-10 minute quiz will be given. (There will be no quizzes during weeks when midterm exams are held.) Quizzes are meant to reinforce overarching concepts and emphasize understanding of principles rather than mathematical computation.

Each quiz is worth equal weight, and over the course of the semester, your lowest quiz score will be dropped.

**Exams:**

This course will have 2 in-class midterm exams, dates will be announced soon.

The final exam is a cumulative exam in the same format as the midterm exams. The final exam will be held on Friday, April 26, 2019 from 10:30am - 12:30pm in the normal class meeting room.

Unless otherwise specified, neither calculators nor notes of any kind are allowed on any of the exams or quizzes.

**Grading:**

Your course grade will be computed as follows:

|                |       |
|----------------|-------|
| Homework       | 25%   |
| Quizzes        | 10%   |
| Midterm exams: | 2x20% |
| Final exam:    | 25%   |

Final letter grades will be assigned based on the following scheme:

- 92% - 100% — A
- 90% - 91% — A-
- 88% - 89% — B+
- 82% - 87% — B
- 80% - 81% — B-
- 78% - 79% — C+
- 72% - 77% — C
- 70% - 71% — C-
- 68% - 69% — D+
- 62% - 67% — D
- 60% - 61% — D-

- 0% - 59% — E

**Attendance:**

- Students are allowed two unexcused absences during the semester. More than two unexcused absences may result in a student being dropped from the course.
- Attendance at scheduled class tests and exams is mandatory, unless prior consent has been given by the instructor.

**Tutoring:**

The Department of Mathematics provides free tutoring services through the Tutoring Center for many 1000-level, 2000-level, and for some 3000-level courses. The Tutoring Center provides services for MATH 3150, and is located in room 155 of the T. Benny Rushing Mathematics Center, between buildings JWB and LCB. Please see <https://www.math.utah.edu/undergrad/mathcenter.php> for attending information about the Tutoring Center and for hours of operation.

**Class communication:**

Class communication will be done through canvas and emails will go to your University of Utah email address. I will send a welcome message before the first day of class. If you do not receive this message, get into contact with me as soon as possible.

**ADA Statement:**

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

**Student responsibilities and integrity:**

All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, and I will do so, beginning with verbal warnings and progressing to dismissal from and class and a failing

grade. Students have the right to appeal such action to the Student Behavior Committee.

<http://regulations.utah.edu/academics/6-400.php>