

Math 305

Instructor: Paul T. Allen

Spring 2019

1 Learning objectives

Students in this course should

- understand the origins and qualitative behavior of the “big three” PDEs: the wave equation, Laplace’s equation, the heat/diffusion equation.
- understand the basic theory of Fourier analysis in one dimension: Fourier series, Fourier transform, etc.
- be able to use Fourier analysis to study solutions to the wave, Laplace, and heat equations.
- understand the basic principles and examples of Sturm-Liouville theory
- understand how to use basic Sturm-Liouville problems to construct Laplace eigenfunctions in 2D and 3D.

2 Coursework

- **Homework** consists of shorter problems that complement the lectures. Homework is assigned and collected on a weekly basis.
- **Projects** are longer problems that require students to synthesize their knowledge and then apply that knowledge to a new problem.
- **The final exam** will involve both take-home and in-class components.

3 Grades

Individual assignments and exam problems are graded on the 4.0 grade scale.

Preliminary course grades are computed using a weighted average of grades according to the following:

- 30% Homework
- 50% Projects
- 20% Final Exam

Following the preliminary grade computation, adjustments are made based on improvement, inconsistent coursework, or other factors I deem appropriate.

Ultimately, course grades are assigned based on the grade definitions in the college catalog. In particular, a student who has earned “technically enough points to pass” but who has demonstrated gross negligence with regard to the course material will be awarded a failing grade.