

42045 Introduction to Partial Differential Equations (3)

Knowledge

Students will learn how to solve linear partial differential equations via methods of eigenfunction expansions, Fourier transform. The course includes a brief introduction to Fourier series and Sturm Liouville eigenvalue theorem.

Comprehension

Students will gain understanding of the differences among heat equation, Laplace equation, wave equation, including superposition principle, Fourier series, orthogonally relations, and integral transforms.

Application

Students will be able to apply the knowledge from this class to model and understand phenomena in physics/biology/chemistry.

Analysis

Students will develop the ability to look critically at math models, try to solve them if possible, and analyze the solutions.

Synthesis

The students should get used to combine their skills from Calculus, Linear Algebra, and Ordinary Differential Equations to solve the problems in PDE class.

Evaluation

The students are given in-class exams to test for the understanding of materials. Students will participate course evaluation at the end of semester to critically assessing the effectiveness of the course in meeting their needs, expectations.

Class Activities

To derive, solve, and analyze PDEs in class. To participate in in-class discussions on related topics.

Out of class Activities

To submit every week home assignments. To prepare for mid-terms and comprehensive final exam.