

**Partial Differential Equations**  
**Fall semester 2015**

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**Lectures:** Room: East Middle Yuan 1-204, T 16:00-17:40pm, Th 8:00-9:40am  
**Instructor:** Prof. Ya-Guang Wang      **email:** ygwang@sjtu.edu.cn  
**Office:** Math Building 1210      **phone:** 54743151 ext. 1210  
**Office Hours:** W 3:00 - 5:00pm and by appointment  
**Text:** *An Introduction to Partial Differential Equations, Cambridge Univ. Press 2005,*  
by Yehuda Pinchover & Jacob Rubinstein  
*Partial Differential Equations: An Introduction, 2nd Edition, Wiley, Dec. 2007,*  
by Walter A. Strauss  
*Partial Differential Equations (3rd edition, in Chinese), Higher Education Press 2012,*  
by Guo Chaohao, Li Daqian, Chen Shuxing, Zheng Songmu & Tan Yongji

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**Course Content:**

1. Chapter One: Introduction (Several typical examples of PDEs: transport equations, wave equations, heat equations, Laplace equations; Differential operators and the superposition principle)
2. Chapter Two: Transport Equations (the method of characteristics), the first order linear PDEs in one space variable
3. Chapter Three: Wave equations (Cauchy problem of wave equations in one space variable, progressing waves, Cauchy problems for wave equations in two and three space variables, Huygens Principle, finite speeds of propagation; the initial-boundary value problems for one-dimensional wave equations, the method of separation of variables, energy method)
4. Chapter Four: Heat equations (the initial-boundary value problems for one-dimensional heat equations, Cauchy problem, the Fourier transform method, maximal principles)
5. Chapter Five: Laplace equations (Green functions, maximal principles)
6. Chapter Six: Characteristics, Classification of equations
7. Chapter Seven: Introduction of nonlinear PDEs (Burgers equations, shock waves)

**Grading Policy:** There will be a midterm (25pt of Final Score), a Final (45pt of Final Score), two quizzes (each one will be 10pt of Final Score), and the homework will be counted as 10pt of Final Score.

**Reading Assignments:** Each student is expected to come to class prepared by reading the assigned section before the class meeting.

**Make-up Policy:** There will be no **Make-Up** for Quizzes, Midterms and Final in general.

**Academic Dishonesty:** All cases of suspected dishonesty in my courses will be immediately referred to the Zhiyuan College and University.