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# Math 491: Partial Differential Equations

## Fall 2008

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Section 1  
MWF 3–3:50 PM  
304 Koch Center  
<http://faculty.evansville.edu/ct55>

**Course Description.** Partial differential equations form the understanding of many physical processes in the natural world. For example, PDEs are used to model vibrations of solids, the flow of fluid, the spread of heat, the diffusion of chemicals, and the radiation of electromagnetic waves. In this course we will study the three canonical equation types: the heat (parabolic), wave (hyperbolic), and Laplace (elliptic) equations. An emphasis will be placed on applications of PDEs in the physical sciences.

**Course Objectives.** The goals of the course are to help students develop skills using PDEs to model physical phenomena; interpret solutions of these models within the framework of the situation; develop critical thinking and problem solving skills; and communicate mathematics, both in writing and orally.

**Required Text.** Stanley J. Farlow, *Partial Differential Equations for Scientists and Engineers*, Dover Publications, New York, 1993. We will cover most of chapters 2 and 3, and selected lessons from the remaining chapters. Reading assignments, as well as exercises, will be given from the text.

**Office Hours.** I will be in my office Monday, Tuesday, Thursday and Friday from 1–3 PM, and Wednesday from 2–3 and 4–5 PM; additional times can be arranged by appointment.

**Exams.** There will be two in-class exams, worth 75 points each. Dates will be announced at least two weeks in advance. A cumulative final, worth 100 points, will be given on Monday, December 15 at 2:45 PM.

**Homework.** This course will be problem based; thus homework problems will make up a considerable portion of your grade. There will be five written assignments worth 40 points each. Handwritten solutions are acceptable, but if you foresee a lot of technical writing in your future, you may wish to learn to use  $\text{\LaTeX}$ , a free mathematical typesetting software package. Supplementing the written assignments, students will regularly present solutions to exercises at the board. The presentations will be worth a total of 50 points.

**Attendance.** Regular attendance is expected. There will be very little lecturing; class time will be used to discuss examples, work problems collectively and present solutions at the board. Problems worked in class *may* find their way into the written assignments. You are responsible for any information (including announcements) that you miss. The course website will have up-to-date information. Arriving late or leaving early, reading the newspaper, text-messaging, etc. disrupts the class and is rude and unprofessional.

**Computer Use.** The computers in the classroom are only to be used during class when students are instructed to do so, and only the application students are instructed to use should be opened. There is to be absolutely no web-browsing, instant messaging, e-mailing, working on computer assignments for other courses, or other use of the computers during class. Each unauthorized use of the computer during class time will result in a 5 point deduction from the next exam; this is your first and only warning. Using the computers at inappropriate times distracts both your classmates and your instructor.

**Course Grades.** Your grade in the course will be based on the 500 points described above. The class will be graded on a ten point scale; pluses and minuses will be influenced by such factors as attendance and participation.

**Make-up Policy.** An opportunity to make up missed work will only be granted in the event of a *documented* emergency or illness. If you anticipate a conflict with an announced exam, speak with me **before** the scheduled date.

**Extra Credit.** There will be no extra credit assignments.

**Academic Honesty.** Cheating will not be tolerated. We will follow the University's honor code, which reads "I will neither give nor receive unauthorized aid nor will I tolerate an environment which condones the use of unauthorized aid." Collaboration on homework assignments and projects is encouraged; note that work to be submitted for a grade should be your own and not copied from a fellow student.

**Students with Disabilities.** It is the policy and practice of the University to make reasonable accommodations for students with properly documented disabilities. Written notification to faculty from the Office of Counseling and Health Education is required for any academic accommodations. If you are eligible to receive an accommodation and would like to request it for this course, please discuss it with me and allow two weeks notice. If you have questions about services for students with disabilities or procedures for requesting services, you may contact the Office of Counseling and Health Education at 488-2663.

**Disclaimer.** I reserve the right to change the dates and policies outlined above at my discretion. Any changes will be announced well in advance.