Math 351-000, Partial Differential Equations

Fall 2014

Professor	**Alessandro Veneziani**	Voice	727-7925
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Office hours ...	Thu 11.30am-1.30pm or by appointment	URL	`www.mathcs.emory.edu/∼ale`

Text book:	*Partial Differential Equations for Scientists and Engineers* Dover ed. 1993, by S. Farlow
Chapters:	1, 3, 2, 4 (in this order)
Notes:	Integrative notes will be distributed (by D. Borthwick and A. Veneziani)
Advanced book:	*Partial Differential Equations in Action* 2nd ed., Springer 2010 by S. Salsa

Course Policies

Grades:

There will be quizzes, two tests, a final exam, and 3 graded homeworks. The final grade will be determined as:

40% Tests 30% Final Exam 20% Homework 10%Quizzes

Quizzes:

Every two weeks we will have a 10 minutes quiz with mostly theoretical questions. Quiz will be on Tuesday, at the beginning of the class. First quiz will be on Sept 4th. The lowest score on quizzes will be dropped.

Homework:

Graded homework will be given at the end of each Chapter (3,2,4). Homework is intended to be done *individually*. In addition, *no handwritten reports* will be accepted. Homework should be typewritten (Latex is the preferred editor), saved in a pdf file with the following name: `HWN-YourName.pdf`, where N is the number of Homework (1,2 or 3). The report will be delivered to the address `ale@mathcs.emory.edu` by midnight of the due date.

Tests:

There will be two tests on the following dates:

Tue, Oct 7th Tue, Nov 25th

Final Exam:

The Final Exam is ***cumulative***, and will be given on Dec 11th, 8.00am–10.30am.

Exercises:

I will be providing a list of suggested problems for each section we cover. You are strongly recommended to do all of these problems (even if I don't grade them).

Attendance:

Even if strongly encouraged, attendance is not mandatory.

Missed exams and quizzes:

- Make-up exams will be given only in extreme cases and with prior notice. A written note from the dean is required. Please, see the section Absences from Examinations in the chapter Academic Policies & Regulations of the Emory College Catalog at the following address

  `http://www.college.emory.edu/home/academic/policy/incomplete_absence.html`

  The in-class exams during the term are required mid-term examinations, so are subject to the rule described there. Same goes for the quizzes.

- No make-up quizzes will be given.

- *A missed exam or quiz will count as 0.*

Students with disabilities:
You must contact the Office of Disability Services for accommodations as soon as possible. ODS will then provide a statement of your eligible accommodations to me.
Disruption:
Do not disrupt, distract or prevent others from learning by arriving late, leaving early or eating during classes. A student may be asked to leave the class or the exam for disruptive behavior. All cellphones **must** be turned off at the beginning of each class and exam. If you are waiting an extremely important call for some personal reason, notify it to me **before** the class begins.
Important dates:

- Wed, Sept 3 - End of add/drop/swap.
- Fri, Sept 12 - Last day for a student to change his/her grading status in your class,
- Mon, Oct 12 - Tues, Oct 14 - Fall Break - no classes
- Fri, Oct 17 - Last day for a student to withdraw without penalty
- Tues, Dec 9 - Last day of classes

`http://college.emory.edu/home/academic/policy/withdrawal.html`

Follow up
This Course has a follow-up : May 14th-May 31st, MATH352 (Partial Differential Equations in Action: from medical images to numerical simulations). 3 credits. If you are interested, contact me.
Honor Code:
All students are supposed to adhere the provisions of the Honor Code. For more informations see:
`www.college.emory.edu/current/standards/honor__code.html`

Motivations

Partial Differential Equations (PDEs) are a powerful tool for representing complex phenomena and dynamics. From blood flow to traffic on highways, passing through pricing of derivatives in financial mathematics, PDEs provide a synthetic way for describing the real world. In addition, they provide a *predictive* tool, so that, once a solution of the PDE of interest is computable, we can foresee the formation of a traffic jam or the outcome of a surgical operation.

In this course you will be initiated to this fascinating and complicated world. We will see introductory notions, the different types of PDEs and how they correlate with different physical problems, we will investigate when it is possible to solve analytically a PDE and how. We will limit ourselves to simple problems, yet we will see basic notions that could be helpful for solving "real" problems.

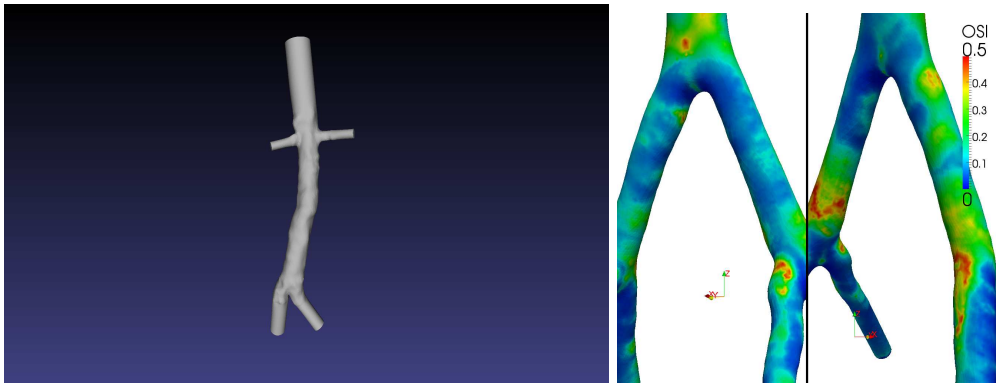

Figure 1: Left: geometrical reconstruction of the descending aorta of a (hopefully) healthy individual (yes, it is the aorta of your instructor). Right: map of the stress on the arteries due to blood - computed by solving (numerically) a system of PDEs.