Computational Methods for Partial Differential Equations
CSC 446/2310 H1 S

Computer Science   Course Description   Winter 2019

Finite Difference and Finite Element methods for Boundary Value Problems (BVPs), including 2-point BVPs and 2-dimensional BVPs. Consistency, stability and convergence of methods. Efficiency of the solution of linear systems. Possibly, initial value problems and the method-of-lines. Special topics of interest among domain decomposition, multigrid, FFT solvers.

Prerequisite: CSC351H1/CSC436H1/(CSC336H1 (75%))/equivalent numerical computing background;
MAT237Y1/MAT257Y1;
APM346H1/APM351Y1/(MAT244H1/MAT267H1 and exposure to PDEs);
CGPA 3.0/enrolment in a CSC subject POSt.

Instructor: Ken Jackson, BA 4228, 416–978–7075 or krj@cs.utoronto.ca

Office Hours: by appointment

Email: I'll try to answer your email within a day or so. If my reply will be long, I'll probably ask you to talk to me instead about your question. If the answer to your question will benefit many students in the class, I will likely copy it to the class (after removing anything from it that will identify you).

I get a lot of email, so it is a good idea to start the Subject line of your email with "CSC 446" or "CSC 2310" so that I can easily distinguish it from other email.

Web Page: `http://www.cs.toronto.edu/~krj/courses/446-2310/`

Bulletin Board: `https://bb-2019-01.teach.cs.toronto.edu/c/csc446`
I'll try to read this every day or two, but it is better to email me.

Lectures: Mondays, Wednesdays and Fridays, 1–2 PM, in GB 244

Tutorials: I will use most of the tutorial periods for lectures.

Course Text: Arieh Iserles, *A First Course in the Numerical Analysis of Differential Equations*, Cambridge University Press, second edition, 2009.

Grading:

1. Term Assignments: 30%
   (Three assignments due February 15, March 15, April 5)

2. Midterm Test: 25%
   (March 8)

3. Final Exam or Course Project: 45%.

You can choose to do either the Final Exam or a Course Project of your own choosing. If you would like to do a Course Project, talk to me about it before you start to ensure that it is suitable.

The Midterm Test and Final Exam are both closed-book: no aids, no calculators, no computers, no tablets, no phones, etc. allowed.

Late Policy: Completed assignments must be submitted at the beginning of the Friday lecture on the date that they are due. Late assignments will be accepted the Monday following the Friday on which they are due (called the "late date" below), with a penalty of 25%. If we have a lecture on the "late date" Monday, hand the assignment in at the beginning of the Monday lecture.

For example, if you hand in your assignment late, the assignment is out of 60 and you get 48/60 before the late penalty is applied, then you will get a final mark of 33/60 for the assignment. That is,

$$\max(48 - 60 \times 0.25, 0) = 33$$

The max above ensures that you won't get a negative mark for an assignment.

Assignments will be accepted after the "late date" specified above only if you have a very good reason for being late.

Academic Integrity: Please read
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