Department of Mathematics & Statistics
Concordia University

MATH 473 (MAST 666/MAST 841), Sec. A

Partial Differential Equations

Winter 2019

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Prerequisites: **MATH 264/265** or an equivalent multivariable calculus course.
MAST 330 or an equivalent course in ordinary differential equations.

Recommended Textbooks: Basic level: Walter A. Strauss, Partial Differential Equations (an introduction).
For more involved reading: Lawrence C. Evans, Partial Differential Equations.
Handwritten (or typed) course notes will be on Moodle.
Online sources might help, too: See, e. g.
https://www.math.uni-leipzig.de/~miersemann/pdebook.pdf
http://web.math.ucsb.edu/~grigoryan/124A.pdf
https://www.ams.org/open-math-notes/omn-view-listing?listingId=110703
etc.

Assignments: Assignments are *very important* as they indicate the level of difficulty of the problems that the students are expected to solve and understand. Therefore, every effort should be made to do and understand them *independently*. The assignments will be corrected and a representative sample graded, with solution sets posted weekly. These grades together are worth a maximum of 10%.

Calculators: Electronic communication devices (including cell phones) are not allowed in examination rooms. Only "Faculty Approved Calculators" (**SHARP EL-531** or **CASIO FX-300MS**) are allowed in examination rooms during mid-term and final.

Test: A midterm test covering the first seven weeks will be given in week 8, worth 30% of the total grade.

Final Grade: The highest of the following:

- 100% final exam.
- 30% midterm, 10% assignments, and 60% final exam.

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

	Topics
1	Types of Second-Order Equations. Canonical form. Method of characteristics.
2	D'Alembert solution to the one-dimensional wave equation. Infinite and semi-infinite string.
3	3D and 2D wave equations, method of descent.
4	Fourier series. Sturm-Liouville problem.
5	Fourier method: Mixed initial boundary value problems for the wave and heat equations in dimension one.
6	Separation of variables in dimension two. Bessel functions.
7	Laplace equation. Dirichlet and Neumann problems. Green function
8	Elements of the theory of distributions. Fourier transform. Fundamental solutions.

Academic Integrity and the Academic Code of Conduct

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: concordia.ca/students/academic-integrity." *[Undergraduate Calendar, Sec 17.10.2]*