MA876 Course Syllabus
Spectral Methods for PDEs
T/TH 12:30PM-1:45PM, MCS B31

Instructor Information:
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Course Webpage:
http://math.bu.edu/people/isaacson/ma876-spring-2020/ma876.html

Office Hours (Subject to change):
Tuesday 4-5pm, Wednesday 1:30-2:30pm MCS 228.

Basic References:
Will be posted on the course webpage with links.

Description and Goals:
This course introduces spectral methods for the numerical solution of PDEs. We will begin with Fourier-based methods, and then cover Chebyshev-polynomial methods. Galerkin, Tau and Collocation approaches will be studied. For both Fourier and Chebyshev approaches, we will study approximation properties of the basis functions, derivative approximations, fast solution methods, stability of approximations and convergence. Later topics will include time discretizations, nonlinear problems (including reaction-diffusion PDEs), and modern spectral method techniques with broad applicability that underly packages such as Chebfun and Approxfun.

Grading:
Class attendance is required. Registered students will be expected to present a topic of their choosing on spectral methods for two lectures. Grading will be based on class attendance and the presentation.