Variational and Computational Methods for PDEs

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Core Audience: 1st/2nd/3rd yr, pure or applied maths

Topics:
1. Variational formulations of elliptic problems
   (Green's formulae, bilinear forms, Lax-Milgram lemma)
2. The finite element method
   (discrete variational formulations, basis functions, local and global stiffness matrices, Cea's lemma, error analysis, Bramble-Hilbert Lemma, properties of linear systems)
3. Sobolev spaces
   (Fourier transformation, weak derivatives, trace theorem, dual spaces)

Literature: