

Course title	Interpolation, approximation and their applications
Subtitle	Finite element methods in the context of the Helmholtz equation
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Course abstract	Finite element methods are widely used to discretize elliptic and quasi-elliptic PDE systems. In the context of the Helmholtz equation, these methods will be presented and analyzed. The lecture will be illustrated with practical classes where the students can code these finite element methods in Python.
Analytical list of topics	<ol style="list-style-type: none"> <li>1. Theory of finite element for elliptic problems (Lax-Milgram Lemma, Céa Lemma)</li> <li>2. Implementation of a high-order finite element method to solve the Neumann problem</li> <li>3. Theory of finite element method for the Helmholtz equation</li> <li>4. Implementation of a high-order finite element method to solve a Fourier problem.</li> </ol>