


5.00 credits

30.0 h + 30.0 h

Q1

Teacher(s)	Claeys Tom ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Basic numerical analysis courses (e.g., LMAT1151 or LFSAB1104), basic concepts of linear algebra and analysis.
Main themes	<ul style="list-style-type: none"> <li>- Interpolation                             <ul style="list-style-type: none"> <li>• polynomial interpolation,</li> <li>• piecewise approximations and splines.</li> </ul> </li> <li>- Fourier analysis                             <ul style="list-style-type: none"> <li>• Fourier coefficients,</li> <li>• Fourier series,</li> <li>• convergence and Gibbs phenomenon,</li> <li>• Fejer process.</li> </ul> </li> <li>- Numerical integration                             <ul style="list-style-type: none"> <li>• basic methods,</li> <li>• quadrature rules.</li> </ul> </li> </ul> <p>Evaluation will be based on an exam and projects.</p>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p style="padding-left: 40px;">At the end of this activity, the student will be able to :</p> <p>1 - implement approximation methods using software, - construct, mathematically analyze and evaluate approximation methods.</p>
Evaluation methods	The evaluation will consist of an exam, which will contain more theoretical questions and exercises, and a project to be done during the quadrennium. Students registered for the September term may choose to submit a revised version of the project.
Teaching methods	Lectures and practice sessions
Content	<p><b>Topics covered :</b></p> <ul style="list-style-type: none"> <li>- Introduction to approximation theory</li> <li>- Approximation by polynomials</li> <li>- Approximation by trigonometric polynomials</li> <li>- Polynomial interpolation</li> <li>- Introduction to Bézier curves and splines</li> <li>- Fourier series</li> <li>- Orthogonal polynomials,</li> <li>- Quadrature rules.</li> </ul> <p><b>At the end of this activity, the student will be able to :</b></p> <ul style="list-style-type: none"> <li>- implement approximation methods using software,</li> <li>- construct, mathematically analyze and evaluate approximation methods.</li> </ul>
Inline resources	<a href="https://moodleucl.uclouvain.be/course/view.php?id=12858">https://moodleucl.uclouvain.be/course/view.php?id=12858</a>
Faculty or entity in charge	MATH

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Minor in Mathematics	<a href="#">MINMATH</a>	5		
Bachelor in Mathematics	<a href="#">MATH1BA</a>	5		