UCLouvain

lmat1351

2026

Approximation: methods et theory

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 (LMAT1122 and LMAT1131).
Main themes	- Interpolation • polynomial interpolation, • piecewise approximations and splines. - Fourier analysis • Fourier coefficients, • Fourier series, • convergence and Gibbs phenomenon, • Fejer process. - Numerical integration • basic methods, • quadrature rules. Evaluation will be based on an exam and projects.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 At the end of this activity, the student will be able to : - implement approximation methods using software, - construct, mathematically analyze and evaluate approximation methods.
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	**Topics covered :** - Introduction to approximation theory - Approximation by polynomials - Approximation by trigonometric polynomials - Polynomial interpolation - Introduction to Bézier curves and splines - Fourier series - Orthogonal polynomials, - Quadrature rules. **At the end of this activity, the student will be able to :** - implement approximation methods using software, - construct, mathematically analyze and evaluate approximation methods.
Inline resources	https://moodleucl.uclouvain.be/course/view.php?id=12858
Faculty or entity in charge	MATH

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Minor in Mathematics	MINMATH	5		🔍
Bachelor in Mathematics	MATH1BA	5		🔍