INSTITUT NATIONAL DES SCIENCES APPLIQUÉES LYON

Mathematics

Mathematics

IDENTIFICATION

CODE : GM-3-S1-EC-MATH
ECTS : 3.0

HOURS

Lectures :	10.0 h
Seminars :	24.0 h
Laboratory :	8.0 h
Project :	0.0 h
Teacher-student contact :	42.0 h
Personal work :	42.0 h
Total :	84.0 h

ASSESSMENT METHOD

TEACHING AIDS

TEACHING LANGUAGE

French

CONTACT

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AIMS

The main aim of mathematics teaching is to develop engineering students' skills in understanding and manipulating mathematical tools that are essential to their training and form an integral part of the mathematical culture of a mechanical engineer: analysis and solution of differential equations and differential systems, Laplace and Fourier transforms and their applications, projection, orthogonal bases (especially Fourier series and orthogonal polynomials), and least-squares methods.

CONTENT

"1. Reminder of differential equations, systems of differential equations, linearization, stability, Newton's method.

2. Fourier transform and applications (definition, properties, convolution, application to solving differential equations, distributions, transform of a distribution, discrete transform).

3. Laplace transform and applications (definition, properties, application to solving problems with initial values).

4. Projection, least squares, Hilbert spaces, bases, Fourier series, orthogonal polynomials, approximate integration."

PRE-REQUISITE

FIMI mathematics program: analysis (continuity, derivability, limit calculations, limited developments), integrals of continuous functions, improper integrals, matrix linear algebra, eigenvalues and eigenvectors, function sequences and series.