Mathematics Part 3

Données Générales

Programme Académique	**ECAM LaSalle Mechanical and Electrical Engineering Programme**
Type d'EC : Cours	**Mathematics Part 3** (LIIEEng01EMathematics3)

TD : 20h00 Cours : 10h00 Travail personnel : 30h00 Durée totale: 60h00	Statut	Periode Semester 1	Langue d'enseignement : English

Acquis d'apprentissage

MàJ 16/04/2025: This first semester is mostly dedicated to the study of real-valued functions with one variable. Students will explore the concepts of limits, continuity, differentiability and integrability. Although Calculus is the main point, this course covers classical results from complex numbers and polynomials. It also provides the resolution of linear systems using matrices, and of ordinary differential equations (first and second orders).
Special attention will be given at constructing clear mathematical arguments and applying processes to Physics. Lessons and assessments will priorize mental calculations instead of the use of the calculator.

This TUC belongs to the TU Mathematics for Engineering 1.

Amongst the skills/knowledges we would like students to acquire, there are :
• To analyze a system or a problem
• To exploit the model/design of a real/virtual system
• To build an argumented and logical reasoning in a scientific way
• To analyse a system by decomposing it into simpler sub-systems
• To find an exact value or an approximation to a problem, by calculation or by graphical resolution or by a step-by-step process.
• To react positively facing a new problem by finding at least an approach, then considering later other ways to solve it.
• To understand the parallels between different fields in Mathematics (Algebra, Geometry, Calculus…) and the ways to pass from one to another.

Contenu

o Matrices
o Linear systems
o Vector Geometry

Prérequis

Any baccalaureate having a strong scientific content:
- algebraic manipulation (fractions, surd form, power numbers...)
- resolution of equations (linear, quadratic, simultaneous, trigonometric...)
- trigonometry
- vector manipulation (addition, decomposition, scalar product..)
- function analysis (sketching, behaviour...) on basic functions (linear, quadratic, exponential, logarithmic...)
- differentiation and integration of basic functions (linear, quadratic, exponential, logarithmic...)

Bibliographie

Stewart, J. Calculus: Early Transcentals, 8th Ed.
Strang, G. (1991). Calculus. Wellesley, Mass.: Wellesley-Cambridge Press.
Kreyszig, Erwin. (1983). Advanced engineering mathematics. New York :Wiley

Évaluation(s)

N°	Nature	Coefficient	Objectifs
1	Chapters seen during the dedicated period.	30	90-minute examination No calculator, nor electronic device, neither document
2		1	Written exam
3		1	Written exam