This program aims to develop a useful mathematical culture for non-mathematician scientific students, and equip them with practical tools for other scientific domains. No specific prerequisites are required. The mathematical notions are very often illustrated with practical applications and examples from other scientific domains: chemistry, mechanics, epidemiology.

**Program outline**

**Semester 1: LINEAR ALGEBRA**
- Vector spaces.
- Matrix calculation: definitions, sums, products.
- Inverse matrices and determinants.
- Linear systems and gaussian elimination.
- Applications.
- Practical sessions on computers: resolution of systems, inversion of matrices.

**Semester 2: EUCLIDEAN SPACES**
- Euclidean spaces.
- Orthogonal group.
- Eigenvectors, eigenvalues.
- Diagonalization.
- Applications in biology, physics, chemistry.
- Practical sessions on computers: calculation of eigenvalues.

**Semester 3: PROBABILITY THEORY & STATISTICS**
- Probability spaces, discrete random variables, real-valued random variables.
- Classical limit theorems.
- Descriptive statistics: summary statistics, graphs.
- Statistical inference: statistical estimation, confidence interval.
- Principal component analysis.
- Practical sessions on computers: with a statistical software.

**Semester 4: INTEGRATION & DIFFERENTIAL EQUATIONS**
- Calculation of integrals.
- Parametric integrals.
- Qualitative study of differential equations.
- Stability.
- Numerical schemes.
- Practical computer sessions: numerical convergences, phase portraits.

**Semester 5: MODELLING & SCIENTIFIC COMPUTING**
- Interpolations.
- Research of zeros of functions.
- Numerical integrals.
- Introduction to signal transmission techniques.
- Practical sessions on computers.

**Semester 6: TO BE SPENT ABROAD IN A PARTNER UNIVERSITY**

**Strengths**

- Scientific English: as of the 1st semester, all maths classes are taught in English and the teaching material provided is also in English.

- Distance learning: the minor subjects are often taught via distance learning. The teaching team provides high-performing training tools, regrouped on a Moodle platform which enables students to be coached throughout the course and, at the same time, to become independent in their learning.

- International mobility: many exchange agreements with foreign universities are available for students in the International Cursus. In Mathematics notably, the teaching team has established a privileged student exchange convention with the University of Ottawa, Canada. Consequently, students may continue to develop this expertise abroad.

**Contact**

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