



## MATH2410 Differential topology

[30h] 3 credits

This course is taught in the 1st semester

**Teacher(s):** Pierre Van Moerbeke  
**Language:** French  
**Level:** Second cycle

### Aims

Presentation of the theory of Riemann surfaces as a theory and as a tool for applications in mechanics and in resolution of partial differential equations in relations with recent research

### Main themes

The central subject is the space of dimension 1 complex surfaces, i.e. Riemann surfaces. The Riemann surfaces form a theory where topology and analysis interact in a very efficient way. The Riemann-Roch theorem (on the number of meromorphic functions with prescribed poles) and its important consequences form a nice illustration of this interplay. The Abel and Jacobi theorems have a transcendental nature. The course will contain a classification of line bundles on Riemann surfaces and abelian varieties (complex tori of higher dimension). A part of the lectures will be devoted to applications to physics and to solutions of partial differential equations.

**Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)**

Prerequisites: knowledge of the course MATH 2420 is advised but not indispensable.

### Other credits in programs

**MATH22/G** Deuxième licence en sciences mathématiques (3 credits)