UCL Université catholique de Louvain

LMAT2260

2010-2011

Complex geometry

6.0 credits	45.0 h	2q

Teacher(s) :	Haine Luc ;
Language :	Français
Place of the course	Louvain-la-Neuve
Prerequisites :	Precursory courses : MAT 1222 Complex Analysis.
Main themes :	- Abstract Riemann surfaces. - The Riemann surface of an algebraic function. - Sheaf cohomology and the Riemann-Roch theorem. - Baker-Akhiezer functions and equations of Korteweg-de Vries type.
Aims :	The introduction by Riemann of a surface covering the complex plane on which an algebraic function w(z) solution of an irreducible polynomial equation P(z,w)=0 becomes single-valued and analytic, is at the basis of the modern concept of a variety. An abstract Riemann surface is defined as a complex connected one-dimensional variety. The aim of the course will be to establish that abstract compact Riemann surfaces are precisely the Riemann surfaces of algebraic functions. The proof will be done by using the tools of modern topology (covering spaces) and algebraic geometry (sheaf cohomology). We will also discuss the relation between compact Riemann surfaces and soliton theory. *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods :	Oral examination.
Teaching methods :	Course : 3 h./week.
Bibliography :	Support: - Otto Forster, Lectures on Riemann Surfaces, Graduate Texts in Mathematics 81, Springer (1981) - Boris Dubrovin, Integrable Systems and Riemann Surfaces, Lecture Notes (preliminary version) (2009)
Other infos :	
Cycle and year of study :	> Master [120] in Mathematics > Master [120] in Physics
Faculty or entity in charge:	MATH