

**COURSE UNIT OUTLINES
2007-2008**

Advanced subjects	
<i>Subject</i>	<i>Credits</i>
Local Algebra	9
Complex Analysis	9
Functional Analysis	9
Algebraic Curves	9
Algebraic Geometry	9
Arithmetic Geometry	9
Geometry and Topology of Manifolds	9
Algebraic Number Theory	9
Professional subjects	
<i>Subject</i>	<i>Credits</i>
Parallel Computing	9
Cryptography and Codes	7,5
Software Engineering	9
Geometry of Vision	7,5
Introduction to Quantitative Finance	9
Optimisation and Control	9
Software Graphics	7,5
Advanced and professional subjects	
<i>Subject</i>	<i>Credits</i>
Applied Harmonic Analysis	9
Algebraic Computation	9
Introduction to Stochastic Calculus	9
Analytical Mechanics	9
Simulation Methods	9
Dynamical Systems	9

Bridging subjects	
<i>Subject</i>	<i>Credits</i>
Commutative Algebra	7,5
Numerical Analysis	7,5
Ordinary Differential Equations	7,5
Partial Differential Equations	7,5
Hilbert Spaces and Fourier Analysis	7,5
Statistics and Modelling	7,5
Analytic Functions	7,5
Differential Geometry	7,5
Introduction to Algebraic Geometry	7,5
Measure and Probability	7,5
Stochastic Processes	7,5
Number Theory	7,5
Algebraic Topology	7,5

Each ECTS credit represents 25 hours of learning.

All units are taught for 4 hours a week.

Course units worth 9 credits are taught exclusively as part of the Master's program.

Course units worth 7.5 credits correspond to mandatory and optional subjects from the current mathematics degree syllabus. The course units will be taught in accordance with the degree program.

**TABLE OF EQUIVALENCE BETWEEN COURSE UNITS WORTH 7,5 CREDITS IN
THE MASTER'S PROGRAM AND COURSE UNITS IN
THE BACHELOR'S DEGREE PROGRAM**

Course unit in the Master's degree	Course unit in the Bachelor's degree
Commutative Algebra (bridging)	Commutative Algebra (optional)
Numerical Analysis (bridging)	Numerical Analysis (mandatory)
Cryptography and Codes (professional)	Cryptography and Codes (optional)
Ordinary Differential Equations (bridging)	Differential Equations (mandatory)
Partial Differential Equations (bridging)	Partial Differential Equations (optional)
Hilbert Spaces and Fourier Analysis (bridging)	Functional Analysis (mandatory)

Statistics and Modelling (bridging)	Statistics II (optional) Applied Statistical Methods (optional)
Analytic Functions (bridging)	Analytic Functions (mandatory)
Geometry of Vision (professional)	Geometry in Computer Vision (optional)
Differential Geometry (bridging)	Differential Geometry (mandatory)
Introduction to Algebraic Geometry (bridging)	Introduction to Algebraic Geometry (optional)
Measure and Probability (bridging)	Probability II (optional)
Stochastic Processes (bridging)	Stochastic Processes (optional)
Software Graphics (professional)	Software Graphics (optional)
Number Theory (bridging)	Number Theory (optional)
Algebraic Topology (bridging)	Algebraic Topology (mandatory)

FINAL ASSIGNMENT (15 CREDITS)

Students specializing in research and advanced academic training must complete an end-of-program research project. Students choosing the professional pathway must complete an end-of-program placement report based on an in-company placement carried out at a firm or institution. Both will be worth 15 credits.

- The teachers leading the research and advanced academic training pathway will suggest topics for students' research projects and will then supervise project work. The Coordination Committee will assign projects according to student preferences and the reports of academic advisors. A final paper and an oral presentation will be required, and a grade will then be awarded.
- In the professional pathway, students will complete a placement in cooperation with a company or institution. A work plan must be approved by the student's academic advisor and the supervisor at the company or institution involved. A final report on the placement must be written, including an assessment from the in-company supervisor. An oral presentation will also be required.