

# COURSE DETAIL

## NUMBER THEORY

**Country**

France

**Host Institution**

University of Bordeaux

**Program(s)**

University of Bordeaux

**UCEAP Course Level**

Upper Division

**UCEAP Subject Area(s)**

Mathematics

**UCEAP Course Number**

105

**UCEAP Course Suffix****UCEAP Official Title**

NUMBER THEORY

**UCEAP Transcript Title**

NUMBER THEORY

**UCEAP Quarter Units**

6.00

**UCEAP Semester Units**

4.00

## Course Description

This course covers number theory. Topics include integers on a ring: completely closed rings, quadratic bodies, norm, trace, discriminant in the case of extensions of bodies. Example of cyclotomic bodies of degree  $p-1$ ; Dedekind rings: Noetherian property; application to integer elements, fractional ideals, fraction rings, localization, group of fractional ideals, norm of an ideal, multiplicativity; decomposition of ideals in an extension: prime ideal, discriminant and ramification, quadratic and cyclotomic bodies of degree  $p-1$ , quadratic reciprocity law; class group and unit theorem: networks, canonical folding, statement and proof of the finiteness of the class group, statement of the unit theorem, illustration in the case of quadratic bodies, Fermat cases (or other Diophantine equations); analytical opening (Riemann zeta function, Dirichlet L-functions, Dedekind zeta functions, link to counting prime numbers and ideals).

### Language(s) of Instruction

French

### Host Institution Course Number

4TMA807U

### Host Institution Course Title

NUMBER THEORY

### Host Institution Campus

UNIVERSITY OF BORDEAUX

### Host Institution Faculty

SCIENCES AND TECHNOLOGIES

### Host Institution Degree

### Host Institution Department

MATHEMATICS

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