

## Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT440	Mathematical Structures and Formalization	7	3	0	0	3	5

Prerequisites	
Admission Requirements	

Language of Instruction	French
Course Type	Elective
Course Level	Bachelor Degree
Objective	-
Content	Overview of functional programming, Types, Terms, Equality, different kinds of types, structures, classes Setting up well-known mathematical structures in Lean, proving well-known theorems via Lean
References	How To Prove It (with Lean), Daniel J. Velleman Theorem Proving in Lean 4, Jeremy Avigad, Leonardo de Moura, Soonho Kong, and Sebastian Ullrich,

## Theory Topics

Week	Weekly Contents
1	Overview and Installation
2	Lean Syntax and Proof Interface
3	Logic Review in Lean
4	Proof Tactics and Style
5	Structures and Type Classes
6	Inductive Types and Recursion
7	Proofs by Induction
8	Sets and Relations
9	Algebraic Hierarchy
10	Number Theory in Lean I
11	Number Theory in Lean II
12	Finite Structures and Combinatorics I
13	Finite Structures and Combinatorics II
14	Analysis in R