Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MATH 642		2	3	0	0	3	7

Prerequisites	
Admission Requirements	

Language of Instruction	English
Course Type	Elective
Course Level	Doctoral Degree
Objective	-
Content	Overview of functional programming, Types, Terms, Equality, di?erent 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