Incoming student mobility

UNIOS University Unit: DEPARTMENT OF MATHEMATICS

COURSES OFFERED IN FOREIGN LANGUAGE
FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	**Department of Mathematics**

Study program	*Graduate university study programme in mathematics (Master level)* *Branch:* • *Mathematics and Computer Science-obligatory*

Study level	Graduate (master)

Course title	**Semantics of programming languages**
Course code (if any)	MI008
Language of instruction	English
Brief course description	**Syllabus.** 1. Introduction. Lambda notation. Axiomatic, operational, denotational semantics. 2. The language PCF (Programming Computable Functions). Syntax. Booleans and natural numbers. Pairing and Functions. Declarations and syntactic sugar. Recursions and Fixed-point operator. PCF Programs and their semantics. PCF reduction and symbolic interpreters. PCF Programming examples, expressive power and limitations. Variations and extension of PCF. 3. Universal algebra and algebraic data types. Algebras, signatures and terms. Equations, soundness and completeness. Homomorphism and initiality. Algebraic data types. Rewrite systems. 4. Simply-typed lambda calculus. Types. Terms. Proof systems. Henkin modles, soundness and completeness. 5. Imperative programs. While programs. Operational semantics. Denotational semantics. Before-after assertions about While programs. Semantics of additional program constructs.
Form of teaching	Consultative teaching.
Form of assessment	Lectures and exercises are obligatory. The exam consists of a written

	and an oral part. Upon completion of the course, students can take the exam. Successful midterm exam scores replace the written exam. Exercises are both auditory and laboratory. Laboratory exercises include the usage of computers. Students can improve their grades by writing homework assignments and seminars.
Number of ECTS	**6**
Class hours per week	**2+2+0**
Minimum number of students	
Period of realization	**Summer semester**
Lecturer	*Domagoj Matijević*