

Course: Algebraic topology		
Teacher(s): Đorđe Baralić, PhD		
Course status: elective		
ECTS: 12+6		
Prerequisites: -		
Goal The goal of the subject is introduction of homology and cohomology, and basics of homological algebra and algebraic topology to the students. Definitions and properties of topological invariants of spaces and maps.		
Outcomes Students are familiar with basic objects of homological algebra necessary for understanding other advanced courses from topology, geometry and combinatorics.		
Contents <i>Theoretical teaching</i> Simplicial, delta and cell complexes. Chain complexes, simplicial and singular homology. Homotopy invariance. Exact sequences, Mayer-Vietoris sequence and Excision. Mapping degree. Cellular homology. Universal Coefficient Theorem. Cochain complexes and cohomology. Cohomology ring. Poincaré's Duality. Alexander's Duality <i>Practical teaching</i> Software SAGE. Software Macaulay Effective calculations of homology and cohomology		
Recommended bibliography <ol style="list-style-type: none"> 1. Alan Hatcher, <i>Algebraic Topology</i>, Cambridge University Press 2002 2. Glen Bredon, <i>Topology and geometry</i>, Graduate Texts in Mathematics, Springer 1993 		
Active teaching hours: 60	Theoretical: 50	Practical: 10
Methods of teaching 50 theoretical sessions, monologue-dialogue method 10 classes of practical training and project in homological algebra software and computations		
Knowledge estimation: (max 100 points) Project presentation 30+written exam 40+oral exam 30		