

Study programmes: Bachelor studies – Mathematics				
Course name: Algebraic topology				
Lecturers: Siniša Vrećica, Aleksandar Vučić, Vladimir Grujić, Branislav Prvulović				
Status: Compulsory				
ECTS: 5				
Attendance prerequisites: Topology B				
Course aims: Introducing the students to the basic notions and constructions of Algebraic topology (homology groups) and their properties. Applications of the acquired knowledge in establishing many results from Geometry and other areas of Mathematics.				
Course outcome: Students understand the notion of homology groups and could compute homology groups of polyhedra and cell complexes. Using this knowledge, they could prove many important mathematical results such as some fixed point theorems (Brower, Lefschetz), the hairy ball theorem, Borsuk-Ulam theorem and its corollaries.				
Course content: categories and functors; chain complexes; exact sequences; homology of chain complexes; zig-zag lemma; simplicial and singular homology; reduced and relative homology; basic properties and examples; Eilenberg-Steenrod axioms; Brower theorem; degree of a mapping; the hairy ball theorem; the fundamental theorem of algebra; Mayer-Vietoris sequence; CW complexes and their homology; homology with coefficients; the universal coefficient theorem; Hopf trace formula; Lefschetz fixed point theorem; Borsuk-Ulam theorem and its consequences				
Literature: 1. J. Munkres, Elements of algebraic topology, Addison-Wesley, Menlo Park, 1984. 2. A. Hatcher, Algebraic topology, Cambridge University Press, Cambridge, 2001.				
Number of hours: 4	Lectures: 3	Tutorials: 1	Laboratory: -	Research: -
Teaching and learning methods: Frontal / Individual / Interactive / Tutorials / Lectures / Exercises				
Assessment (maximal 100 points)				
Course assignments	points	Final exam		points
Lectures	-	Written exam		30
Exercises / Tutorials	-	Oral exam		40
Colloquia	30	Written-oral exam		-
Essay / Project	-			