

Study programmes: PhD STUDIES - Mathematics				
Course name: CODE 3M114 – Hardy and Bergman Spaces				
Lecturers: Miloš Arsenović				
Status: Optional				
ECTS: 9				
Attendance prerequisites: Analysis 4.				
Course aims: Mastering the concepts and methods of analysis in Hardy and Bergman spaces.				
Course outcome: The student needs to understand and apply notions and techniques of analysis in Hardy and Bergman spaces.				
Course content: Harmonic functions and the Hilbert operator. Basic properties of Hardy spaces for the unit disk. Boundary behavior. Factorization. Harmonic conjugate. Basic properties of Hardy spaces for the upper half plane. Hardy-Littlewood maximal function. Interpolation. BMO functions. Basic topological properties of Bergman spaces. Connections with Lipschitz spaces. Equivalent norms. The Berezin transform. A^p -inner functions. Zeros. Interpolation and sampling. Invariant subspaces. Cyclicity.				
Literature:				
<p>Koosis Paul, <i>Introduction to H^p spaces. With an appendix on Wolff's proof of the corona theorem</i>, London Mathematical Society Lecture Note Series, 40. Cambridge University Press, Cambridge-New York, 1980.</p> <p>Duren Peter L., <i>Theory of H^p spaces</i>. Pure and Applied Mathematics, Vol. 38 Academic Press, New York-London 1970.</p> <p>Garnett John B. <i>Bounded analytic functions</i>. Pure and Applied Mathematics, 96. Academic Press, Inc. [Harcourt Brace Jovanovich, Publishers], New York-London, 1981.</p> <p>Hedenmalm Haakan, Korenblum, Boris, Zhu, Kehe, <i>Theory of Bergman spaces</i>. Graduate Texts in Mathematics, 199. Springer-Verlag, New York, 2000.</p> <p>Duren Peter, Schuster Alexander, <i>Bergman spaces</i>. Mathematical Surveys and Monographs, 100. American Mathematical Society, Providence, RI, 2004.</p> <p>Zhu Kehe, <i>Spaces of holomorphic functions in the unit ball</i>, Graduate Texts in Mathematics, 226. Springer-Verlag, New York, 2005.</p> <p>Zhu Kehe <i>Operator theory in function spaces</i>, Monographs and Textbooks in Pure and Applied Mathematics 139, Marcel Dekker, Inc., New York, 1990.</p>				
Number of hours: 10	Lectures: 4	Tutorials: -	Laboratory: -	Research: 6
Teaching and learning methods: Frontal, tutorial and practical				
Assessment (maximal 100 points)				
Course assignments	points	Final exam		points
Lectures	-	Written exam		-
Exercises / Tutorials	50	Oral exam		50
Colloquia	-	Written-oral exam		-
Essay / Project	-			