

Study programme(s): Mathematics (MD)				
Level: PhD studies				
Course title: Aggregation functions (AN-20)				
Lecturer: Endre E. Pap				
Status: elective				
ECTS: 10				
Requirements:				
Learning objectives Introduction to a unified theory of aggregation functions and special important classes of aggregation functions which appear in various applications.				
Learning outcomes Acquiring full knowledge in a contemporary theory of aggregation functions and their identification depending on the application.				
Syllabus General approach to aggregation functions and their classification by basic properties. Conjunctive and Disjunctive aggregation functions, especially functions related to triangular norms and triangular conorms (uninorms, nullnorms, linear convex operators, twodimensional copulas). Mean value operators and their classification. Construction methods for aggregation functions.				
Literature 1) E.P. Klement, R. Mesiar, E. Pap, Triangular Norms, Trends in Logics 8, Kluwer Academic Publishers, Dordrecht/Boston/London, 2000, 385 pp.. 2) E. P. Klement, R. Mesiar, E. Pap, Invariant copulas, Kybernetika 38, 3 (2002), 275-285. 3) R. B. Nelsen, An Introduction in Copulas, Lect. Notes in Statistics 139, Springer, 1999, rev. ver. 2006. 4) C. Alsina, M. J. Frank, B. Schweizer, Associative Functions, World Scientific, 2006. 5) E.P. Klement, R. Mesiar, E. Pap, Triangular norms as ordinal sums in the sense of A. H. Clifford, Semigroup Forum 65 (2002), 71-82. 6) E. P. Klement, R. Mesiar, E. Pap, Triangular norms I: Basic analytical and algebraic properties, Fuzzy Sets and Systems 143 (2004), 5-26. 7) E. P. Klement, R. Mesiar, E. Pap, Archimax copulas and invariance under transformations, C. R. Math. Acad. Sci. Paris-Mathematics 340 (2005) 755-758. 8) M. Grabisch, J. L. Marichal, R. Mesiar, E. Pap, Aggregation Functions, 2007 (book in preparation).				
Weekly teaching load			Other: 0	
Lectures: 2	Exercises 0	Other forms of teaching: 0	Student research: 6	
Teaching methodology Plenary lectures, problem sessions, independent presentations carried out by students.				
Grading method (maximal number of points 100)				
Pre-exam obligations		points	Final exam	points
Colloquia		50	Oral exam	50