

Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering		Institute of Mechatronics and Vehicle Engineering						
Subject title and code: BMKTNFDBNF, Fuzzy Decision-Making and Applications					Credits: 0			
Full-time study 2025/2026 ac. 2 semester year								
The course is available at: mechatronical engineering								
Supervised by: Prof. Dr. Ludányi- Laufer Edit		Instructors: Felisberto David Wandi Chivela						
Prerequisite (neptun code): -								
Weekly number of lessons								
Lecture: 0	Group seminar: 2	Lab: 0	Consultation:					
Way of assessment: Midterm (Written and oral) mark								
Online consultation (in case it's required): ... (BBB link)								
Edu. goal: Fuzzy set theory is an approach used to solve problems that cannot be solved by classical set theory or probability theory. This course's primary objective is to teach students the fundamental concepts of fuzzy set theory and fuzzy logic used in engineering applications.								
Schedule								
Education week	Topics							
1.	Introduction to Soft computing methods. Fuzzy logic. Neural networks. Genetic algorithms.							
2.	Conventional set theory. Introduction to Fuzzy sets. Membership functions							
3.	Operation on fuzzy sets, fuzzy intersection (t-norm), fuzzy union (t-conorm)							
4.	Aggregation operators. Implication and inference. Defuzzification methods.							
5.	Mamdani type inference system. Matlab Fuzzy Logic Designer.							
6.	Sugeno type inference systems.							
7.	Test 1. Project assignment.							
8.	Neuro-fuzzy systems. ANFIS							
9.	Hierarchical systems.							
10.	Fuzzy systems in decision making							
11.	Fuzzy multi-criteria decision making							
12.	Fuzzy Cognitive Maps.							
13.	Test 2							
14.	Project presentation. Retake							
Mid-semester requirements								
Test amount 2		Assignment to be submitted amount 1		Szöveg beírásához kattintson vagy koppintson ide. amount dates				
dates weeks 7,13		deadlines week 14						
<i>According to the HKR attendance of group seminars and lab exercises are mandatory.</i>								
Other requirements for participation in sessions not covered by the regulations and restrictions on substitutions:								
Test maximum points available		Assignment to be submitted maximum points available		Szöveg beírásához kattintson vagy koppintson ide. maximum points available				
minimum score required to pass /test		minimum score required to pass / assignment		minimum score required to pass /lab				

60points	24points	40points	20points	...points	...points
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Total number of points achievable in semester: ...points				
Grading thresholds	satisfactory 40 % and above	average 55 % and above	good 70 % and above	excellent 85 % and above
Other evaluation criteria:				
During the semester, in accordance with the schedule above, a student can make up the theory midterm if they have a valid official absence note (from a doctor or from a coach), or it was unsuccessful.				
Receive a signature denied entry:	The signature will be denied to that student who misses the midterm and has no absence note to justify their non-attendance, or fails to submit the project assignment or misses more classes than it is allowed by HKR.			
Required references:	Moodle course			
Recommended references:	J.ROSS, Timothy. Fuzzy Logic With Engineering Application, 2010. Sivanandam, S. N., Sai Sumathi, and S. N. Deepa. Introduction to fuzzy logic using MATLAB. Vol. 1. Berlin: Springer, 2007. C. Mathworks, Adaptive Fuzzy Inference System Toolbox, Mathworks 2020. Chakraverty, Snehashish, Deepti Moyi Sahoo, and Nisha Rani Mahato. Concepts of soft computing: fuzzy and ANN with programming. Springer Singapore, 2019.			
Quality assurance methods of the subject:				

Things, that are not included, can be found within the regulations of Óbuda University.