



COURSE / MODULE / BLOCK DETAILS

ACADEMIC YEAR / SEMESTER

Offered by: Endüstri Mühendisliği			
Course Title: INTRODUCTION TO COMPUTATIONAL INTELLIGENCE		Course Org. Title: INTRODUCTION TO COMPUTATIONAL INTELLIGENCE	
Course Level: Lisans		Course Code: IND 4919	
Language of Instruction: İngilizce		Form Submitting/Renewal Date 06/08/2013	
Weekly Course Hours: 3		Course Coordinator: PROFESÖR ADİL BAYKASOĞLU	
Theory	Application	Laboratory	National Credit: 3
3	0	0	ECTS Credit: 4



DOKUZ EYLUL UNIVERSITY

FACULTY OF ENGINEERING OFFICE OF THE DEAN



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Offered to:	Course Status: Compulsory/Elective
Name of the Department:	
Industrial Engineering	Elective Course

Wire: 0 232 301 72 15

Fax: 0 232 301 72 10

Access: <http://www.eng.deu.edu.tr>

Address: Dokuz Eylül Üniversitesi Tınaztepe Yerleşkesi 35160 Buca/İZMİR E-mail: muhendislik@deu.edu.tr



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Instructor/s:

PROFESÖR ADİL

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Course Objective:

To introduce soft computing and be able to model and solve real complex problems with the help of evolutionary computation, neural networks and fuzzy logic.

Learning Outcomes:

- 1 An ability to define main philosophy and concepts of fuzzy set theory, artificial neural networks and evolutionary algorithms
- 2 An ability to derive and solve fuzzy mathematical models which takes into account the uncertainty in real life problems with an optimization package such as LINGO, ILOG OPL
- 3 An ability to use MATLAB toolboxes related to the main computational intelligence techniques such as ?Fuzzy logic? and ?Neural network? toolboxes
- 4 An ability to use MATLAB software in order to code and apply metaheuristic algorithms on the basic optimization problems of industrial engineering
- 5 To enable students to solve complex engineering problems by making use of computational intelligence approaches

Learning and Teaching Strategies:

The presentations which are prepared by using books, articles and proceedings as well as class board will be used in the scope of the course programme.

Assessment Methods:

Name	Code	Calculation formula
Vize	VZ	
Proje	PR	
Final	FN	
Bütünleme Notu	BUT	
BNS	BNS	$VZ * 025 + PR * 025 + FN * 050$
Bütünleme Sonu Başarı Notu	BBN	$VZ * 025 + PR * 025 + BUT * 050$

Further Notes about Assessment Methods:



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Assessment Criteria:

Textbook(s)/References/Materials:

Textbook(s): An Introduction to Fuzzy Sets, Witold Pedrycz, Fernando Gomide, Massachusetts Institute of Technology, USA, 1998.
Neural Fuzzy Systems, Chin-Teng Lin, C.S. George Lee, Prentice Hall, New Jersey 1996.
Fuzzy Logic with Engineering Applications, Timothy J. Ross, Wiley, 2010.
Principles of Neurocomputing for science & Engineering, Fredrick M Ham, Ivica Kostanic, McGraw Hill, 2001.
Metaheuristic Search Concepts: A Tutorial with Applications to Production and Logistics, G. Zapfel, R. Braune, M. Bögl, Springer, 2010.

Course Policies and Rules:

Contact Details for the Instructor:

Professor Adil BAYKASOĞLU, Phd.
adil.baykasoglu@deu.edu.tr

Office Hours:

Afternoon at the thursday and friday

Course Outline:

Week	Topics:	Notes:
1	Introduction to Fuzzy Sets and Its Operations	
2	Linguistic Variables & Membership Functions	
3	Fuzzy Classification and Clustering Methods	



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4	Fuzzy Mathematical Programming & Fuzzy Rule Based Systems
5	Fundamental Concepts and Definition of Neurocomputing
6	Mapping and Self-Organizing Networks and Their Learning Algorithms
7	Statistical Methods Using Neural Networks
8	Mid-term examination
9	Neural Networks for Optimization Problems
10	Introduction to Search Heuristics & Metaheuristics
11	Metaheuristics Based on Solution Construction and Modification
12	Metaheuristics Based on Solution Recombination: Genetic Algorithms
13	Applications of Metaheuristic Algorithms in Production Scheduling & Logistics
14	Term Project Presentations



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ECTS Table

Course Activities	Number	Duration (hour)	Total Work Load (hour)
In Class Activities			
Lectures	14	3	42

Exams

Final	1	1,5	2
Midterm	1	1,5	2

Out Class activities

Preparations before/after weekly lectures	14	2	28
Preparation for midterm exam	1	5	5
Preparation for final exam	1	7	7
Preparing presentations	5	2	10
Total Work Load (hour)			96
ECTS Credits of the Course= Total Work Load (hour) / 25			4