



T.C.

ESKİŞEHİR OSMANGAZİ ÜNİVERSİTESİ

FACULTY OF SCIENCES

MATHEMATICS AND COMPUTER SCIENCES DEPARTMENT



**COURSE INFORMATION FORM**

Course Name	Course Code
Big Data and Machine Learning I	

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
7	2	2		6

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	x			

Course Language	Course Level	Course Type
Turkish	Undergraduate	Elective

<b>Prerequisite(s) if any</b>	
<b>Objectives of the Course</b>	The aim is to equip students with the skills to analyze data using big data technologies and machine learning algorithms. The course is designed to help students understand fundamental concepts and tools within the big data ecosystem, learn techniques used in big data management and analysis, and gain hands-on experience with machine learning algorithms.
<b>Short Course Content</b>	Big Data Ecosystem and Technologies, Data Collection and Preprocessing, Data Analytics and Visualization, Supervised Learning: Core Algorithms, Advanced Techniques in Big Data Analytics, and Project Presentations and Overall Review.

Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1 To understand big data notions, technologies and ecosystems	3,4,5	6	G
2 To sum, clean, change and analyze the data	7	10	G
3 Missing data techniques	10,11	1,13	D
4 Mapreduce: notions and applications	13,15	1,14	F
5			
6			
7			
8			

\***Teaching Methods** 1:Expression, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Trouble/Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

\*\***Measuring Methods** A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

<b>Main Textbook</b>	"Data Science for Business" - Foster Provost, Tom Fawcett, 2013.
<b>Supporting References</b>	1. "Introduction to Data Mining" - Pang-Ning Tan, Michael Steinbach, Vipin Kumar, 2005. 2. "Big Data: Principles and Best Practices of Scalable Real-Time Data Systems" - Nathan Marz, James Warren, 2015.
<b>Necessary Course Material</b>	Laptop and desktop computer.

<b>Course Schedule</b>	
<b>1</b>	Introduction and fundamental notions
<b>2</b>	Big Data Ecosystem and Technologies
<b>3</b>	Big Data Ecosystem and Technologies
<b>4</b>	Data Collection and Preprocessing
<b>5</b>	Data Collection and Preprocessing
<b>6</b>	Data Analytics and Visualization
<b>7</b>	Data Analytics and Visualization
<b>8</b>	Mid-Term Exam
<b>9</b>	Data Analytics and Visualization
<b>10</b>	Supervised Learning: Core Algorithms
<b>11</b>	Unsupervised Learning and Clustering
<b>12</b>	Big Data Analytics and Advanced Techniques
<b>13</b>	Project Presentations and Overall Review
<b>14</b>	Project Presentations and Overall Review
<b>15</b>	Project Presentations and Overall Review
<b>16,17</b>	Final Exam

<b>Calculation of Course Workload</b>			
<b>Activities</b>	<b>Number</b>	<b>Time (Hour)</b>	<b>Total Workload (Hour)</b>
Course Time (number of course hours per week)	14	4	56
Classroom Studying Time (review, reinforcing, prestudy,...)	14	4	56
Homework	5	4	20
Quiz Exam			
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	20	20
Final Exam	1	2	2
Studying for Final Exam	1	30	30
<b>Toplam iş yükü</b>			<b>186</b>
<b>Toplam iş yükü / 30</b>			<b>6,2</b>
<b>Dersin AKTS Kredisi</b>			<b>6</b>

Evaluation	
Activity Type	%
Mid-term	40
Quiz	10
Homework	
Bir öge seçin.	
Bir öge seçin.	
Final Exam	50
<b>Total</b>	<b>100</b>

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	PROGRAM OUTCOME	Contribution
1	The ability to apply knowledges of Mathematics and Computer Sciences,	4
2	To have sufficient theoretical and practical knowledge of Mathematics at international level,	2
3	The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects,	5
4	The skill to solve and design a problem process in accordance with a defined target,	5
5	Skills to analyze data, interpret and apply to other datum and using these data on computer,	5
6	The skill to use the modern techniques and computational tools needed for mathematical applications,	4
7	The skill to make team work within the discipline and interdisciplinary,	5
8	The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences,	4
9	The skill to communicate orally and in written way, in a clear and concise manner by having individual work skills and ability to independently decide and analytical thinking,	3
10	The skill to have professional and ethical responsibility,	4
11	The skill to have consciousness for quality issues and scientific research,	5
12	The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations,	2
13	Ability to solve problems in the working life faced to find an appropriate algorithms via mathematical modeling and to write computer programs,	4
14	The skill to developed design of software systems at different complex levels,	5
15	The credence of necessity of life-long learning and ability to apply the formation long-life learning.	5

LECTUTER(S)				
Prepared by	Assoc. Prof. Elis SOYLU YILMAZ			
Signature(s)				

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