<table>
<tr><th colspan="2">COURSE DESCRIPTION FORM</th></tr>
<tr><td>Course Code and Name</td><td>CENG375 PRINCIPLES OF DATA MINING (TECH.ELECT.)</td></tr>
<tr><td>Course Semester</td><td>5</td></tr>
<tr><td>Catalogue Data of the Course (Course Content)</td><td>Principles of data mining, data preprocessing, supervised and unsupervised learning algorithms, clustering, and association rule mining, real-world applications and ethical considerations in data mining.</td></tr>
<tr><td>Course Textbooks</td><td>Jiawei H., Micheline K., Data Mining: Concepts and Techniques, 2nd Edition, ISBN: 978-1-55860-901-3 The Morgan Kaufmann Series, 2006.</td></tr>
<tr><td>Supplementary Textbooks</td><td>Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Introduction to Data Mining, 3rd Edition, Pearson, 2014.
Jiawei Han, Micheline Kamber and Jian Pei, Data Mining Concepts and Techniques, 3rd Edition, Morgan Kaufmann, 2012.
T. Hastie, R. Tibshirani, and J. Friedman, The Elements of Statistical Learning: Data Mining, Inference, and Prediction, 2nd Edition, Springer, 2017.</td></tr>
<tr><td>Credit (ECTS)</td><td>6</td></tr>
<tr><td>Prerequisites for the Course (Attendance Requirements)</td><td>-</td></tr>
<tr><td>Course Type</td><td>Elective</td></tr>
<tr><td>Language of Instruction</td><td>English</td></tr>
<tr><td>Course Objectives</td><td>Introduce the data mining process, explain various data mining techniques and algorithms and teach to apply data mining methods to real-world problems.</td></tr>
<tr><td>Course Learning Outcomes</td><td>1. Explains the basic principles and concepts of data mining
2. Applies data preprocessing techniques to prepare data for mining.
3. Implement supervised and unsupervised learning algorithms for data analysis.
4. Identify the metrics for evaluating the performance of data mining models.
5. Use data mining techniques to solve practical problems in various domains.</td></tr>
<tr><td>Instruction Method
(Face-to-face, Distance education etc.)</td><td>Face-to-face</td></tr>
<tr><td>Weekly Schedule of the Course</td><td>Week 1: Introduction to Data Mining
Week 2: Data Preprocessing – Types of Data, Data Preparation
Week 3: Data Warehouses, OLAP
Week 4: Classification – Basic Concepts, Decision Trees
Week 5: Classification – Rule Based Classifiers, Bayesian Classifiers
Week 6: Model Evaluation Metrics
Week 7: Classification – Nearest-Neighbor Classifiers, Artificial Neural Networks
Week 8: Association Analysis – Mining Frequent Patterns
Week 9: Association Analysis – Advanced Pattern Mining
Week 10: Cluster Analysis: Partition Based Clustering, Hierarchical Clustering
Week 11: Cluster Analysis: Density Based Clustering, Graph Based Clustering
Week 12: Anomaly Detection
Week 13: Data Mining Trends and Applications
Week 14: Ethical considerations in data mining</td></tr>
<tr><td>Teaching Activities
(The time spent for the activities listed here will determine the amount of credit required)</td><td>Weekly theoretical course hours: 3
Reading activities
Internet search and library work
Making a report
Preparing and making presentations
Midterm and revision for midterm
Final exam and revision for final exam</td></tr>
<tr><td>Assessment Criteria</td><td>
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<tr><th></th><th>Number(s)</th><th>Weight (%)</th></tr>
<tr><td>Midterm exam</td><td>1</td><td>30</td></tr>
<tr><td>Assignment</td><td></td><td></td></tr>
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	Application		
	Project	1	30
	Practice		
	Quiz		
	Final exam	1	40
	Total	3	100

Workload of the Course

Activity	Number of Weeks	Duration (Weekly Hour)	End of Semester Total Workload
Weekly theoretical course hours	14	3	42
Weekly practical course hours			
Reading activities	14	2	28
Internet search and library work	14	2	28
Designing and implementing materials			
Making a report	1	10	10
Preparing and making presentations	1	10	10
Midterm and revision for midterm	1	20	20
Final exam and revision for final exam	1	20	20
Total workload			150
Total workload/ 25			6
Course Credit (ECTS)			6

Contribution Level between Course Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Knowledge of mathematics, science, basic engineering, computing, and computer engineering; ability to use this knowledge in solving complex engineering problems.					X
2	Ability to define, formulate and analyze complex engineering problems using basic science, mathematics and engineering knowledge and considering the UN Sustainable Development Goals relevant to the problems addressed.					X
3	Ability to design creative solutions to complex engineering problems; ability to design complex systems, processes, devices, software, algorithms or products to meet current and future requirements, considering realistic constraints and conditions.					X
4	Ability to select, use and develop appropriate techniques, resources and modern engineering and informatics tools, including estimation and modeling, for the analysis and solution of complex engineering problems while being aware of their limitations.					X
5	Ability to use research methods to examine complex engineering problems or research topics in computer engineering, including reviewing the literature, designing experiments, conducting experiments, collecting data, analyzing and interpreting results.					X
6	Knowledge of the effects of engineering practices and the standards used in these practices on society, health and safety, economy, sustainability and environment within the scope of the UN Sustainable Development Goals; awareness of the consequences of engineering solutions in the				X	

		fields of information security and law.					
	7	Acting in accordance with engineering professional principles and knowledge on ethical responsibility; awareness of acting impartially, without discrimination on any issue, and being inclusive of diversity.				X	
	8	Ability to work effectively individually and as a team member or leader in intradisciplinary and multidisciplinary teams (face-to-face, remote, or hybrid).				X	
	9	Ability to conduct effective verbal and written communication on technical issues in Turkish or English, prepare reports, make effective presentations and prepare software documentation, considering the various differences of the target audience (such as education, language, profession).					X
	10	Knowledge of business practices such as project, risk and change management and economic feasibility analysis; awareness of entrepreneurship and innovation.		X			
	11	Lifelong learning skill that includes the ability to learn independently and continuously, to adapt to new and developing scientific practices and technologies, and to think inquisitively about technological changes.		X			
Lecturer(s) and Contact Information	Lecturer's First/Last Name: Asst. Prof. Dr. Tuba ÇAĞLIKANTAR E-mail address: tubac@gazi.edu.tr						