Course Description Form	
Course Code and Name	CENG313 INTRODUCTION TO DATA SCIENCE
Course Semester	5
Catalog Content	Data science applications, data analysis tools, data visualization, data types, transformations on data types, operations on data tables, data preprocessing, attribute analysis, dimensionality reduction, statistical, supervised and unattended learning, best practices in data analysis projects
Textbook	Data Science, John D. Kelleher, Brendan Tierney, The MIT Press, 2018.
Supplementary Textbooks	- The data analysis handbook, I. E. Frank and R. Todeschini, Elsevier, 1994. - The Data Science Handbook, Field Cady, Wiley, 2017.
Credit	4
Prerequisites of the Course **(** *Attendance Requirements***)**	-
Type of the Course	Compulsory
Instruction Language	English
Course Objectives	To provide theoretical and practical knowledge about data types and measurements under the scope of data science, activity flow in data science projects, data modeling, data visualization. To gain familiarity with the programs required for data analysis and develop sample applications in data science projects
Course Learning Outcomes	Students who have successfully completed this course will have general knowledge on data science activities, data analysis tools, data visualization, data types, data tables, operations on data tables, data analysis, feature extraction, dimensionality reduction, statistics, supervised and unsupervised learning. They have the opportunity to specialize on an area by employing on a project during its analysis, system modeling and development processes.
Instruction Methods	The mode of delivery of this course is face to face
Weekly Schedule	Week 1: Introduction to data science Week 2: General workflow in data science activities Week 3: Data analysis tools, data visualization Week 4: Data types, transformations Week 5: Operations on data tables Week 6: Data preprocessing Week 7: Attribute analysis and dimensionality reduction Week 8: Statistical Learning Week 9: Supervised learning Week 10: Supervised learning Week 11: Unsupervised learning Week 12: Best practices in data science projects (text data) Week 13: Best practices in data science projects (image data) Week 14: Best practices in data science projects (Time series)
Teaching and Learning Methods *(These are examples. Please fill which activities you use in the course)*	Weekly theoretical course hours: 3 Reading Activities Internet browsing, library work Material Design and Implementation Preparation of Midterm and Midterm Exam Final Exam and Preparation for Final Exam

Assessment Criteria

	Numbers	Total Weighting (%)
Midterm Exams	1	25
Assignment	2	10
Application	0	0
Projects	1	25
Practice	0	0
Quiz	0	0
Percent of In-term Studies (%)		60
Percentage of Final Exam to Total Score (%)		40
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	3	42
Weekly Tutorial Hours	0	0	0
Reading Tasks	2	4	8
Studies	0	0	0
Material Design and Implementation	7	4	28
Report Preparing	0	0	0
Preparing a Presentation	0	0	0
Presentations	0	0	0
Midterm Exam and Preparation for Midterm Exam	1	10	10
Final Exam and Preparation for Final Exam	1	12	12
Other (should be emphasized)	0	0	0
Total Workload			100
Total Workload / 25			4
Course Credit (ECTS)			4

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems			X		
2	Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these purposes		X			
3	Ability to design a complex system, process, device, software, algorithm, or product under realistic constraints and circumstances to meet certain requirements; ability to apply modern design techniques for this purpose			X		
4	Ability to choose, develop and use modern techniques and tools necessary for engineering applications; ability to effectively use computing technologies		X			
5	Ability to design and implement systems or experiments to solve engineering problems, collect and interpret data to evaluate and analyze the results of solutions				X	

	6	Ability to work effectively in intradisciplinary and interdisciplinary teams or individually		X			
	7	Ability to efficiently prepare, evaluate and interpret reports		X			
	8	Ability to make presentations and conduct effective verbal and written communication in Turkish and English			X		
	9	Awareness of the necessity of lifelong learning; ability to access information, follow scientific and technological developments; ability to perpetually renew oneself	X				
	10	Awareness of professional and ethical responsibility, ability to act in accordance with ethical principles		X			
	11	Ability to apply knowledge on project management, risk management and change management	X				
	12	Awareness of entrepreneurship and innovation, ability to design and build	X				
	13	Ability to devise local and global solutions to contemporary issues considering the effects of engineering applications on health, environment and security		X			
	14	Awareness of the legal consequences of engineering solutions		X			
	15	Ability to apply knowledge on software development process and documentation rules	X				
	16	Knowledge on standards used in engineering applications	X				
	17	Awareness of occupational health and safety, information security and privacy					
The Course's Lecturer(s) and Contact Information	Computer Engineering Department Chair bmbb@gazi.edu.tr						