Course Description Form	
Course Code and Name	BDA5104 Advanced Data Science and Analytics
Course Semester	Fall/Spring
Catalog Content	Big data analysis
Textbook	1. Hadoop: The Definitive Guide, Tom White, 3rd. Ed., O'Reilly Media, 2012. 2. MapReduce Design Patterns: Building Effective Algorithms and Analytics for Hadoop and Other Systems, Donald Miner, Adam Shook, O'Reilly Media, November 2012. 3. Learning Spark: Lightning-Fast Big Data Analysis, Holden Karau, Andy Konwinski, Patrick Wendell, Matei Zaharia, O'Reilly Media, 2015.
Supplementary Textbooks	1. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, EMC Education Services, 2015. 2. Spark: The Definitive Guide: Big Data Processing Made Simple, Matei Zaharia, O'Reilly Media, 2018. 3. High Performance Spark: Best Practices for Scaling and Optimizing Apache Spark, Rachel Warren, Holden Karau, O'Reilly Media, 2018. 4. Big Data For Dummies, Judith S. Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman, John Wiley & Sons, 2013.
Credit	8
Prerequisites of the Course (Attendance Requirements)	There is no prerequisite or co-requisite for this course. 80% attendance is required.
Type of the Course	Elective
Instruction Language	English
Course Objectives	The aims of this course are introducing the technologies that can be used for big data manipulation, storage, analysis and analysis as a whole and making applications with examples.
Course Learning Outcomes	At the end of this course the student will be able to 1. Define and apply advanced computer engineering concepts 2. Formulate and solve advanced engineering problems 3. Interpret and analyze scientific research in the field of engineering and use the knowledge in the field of study 4. Find methods of developing existing knowledge 5. Write progress reports based on published documents, theses and articles.
Instruction Methods	This course is carried out only in the form of face2face training.
Weekly Schedule	1: Data cleaning and standardization. 2: MapReduce 3: Introduction to Hadoop. 4: Batch processing 5: HBase and NoSQL with Low Delay. 6: Real-time analysis and search in Impala and Flume 7: Flow Calculation 8: Types of Data Analytics in Data Science 9: Visualization of big data 10: Case studies in IT 11: Case studies in social and health fields 12: Final projects and presentations 13: Final projects and presentations 14: Final projects and presentations

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course
Reading Activities
Internet browsing, library work
Report preparing
Preparing a Presentation
Presentations
Preparation of Midterm and Midterm Exam
Final Exam and Preparation for Final Exam

Assessment Criteria

	Numbers	Total Weighting (%)
Midterm Exams	1	30
Assignment	4	10
Application	0	0
Projects	1	60
Practice	0	0
Quiz	0	0
Percent of In-term		
Studies (%)		40
Percentage of Final		

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	13	3	39
Studies	13	1	13
Material Design and Implementation	0	0	0
Report Preparing	8	4	32
Preparing a Presentation	2	10	20
Presentations	2	2	4
Midterm Exam and Preparation for Midterm Exam	1	20	20
Final Exam and Preparation for Final Exam	1	30	30
Other (should be emphasized)	0	0	0
Total Workload			200
Total Workload / 25			8.0
Course Credit (ECTS)			8.0

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Reaches the expansion of knowledge by conducting scientific research in the field of engineering and evaluation, interpretation and application of information.					X
2	Has extensive and in depth knowledge including the					X

		latest techniques, methods applied and their limitations in engineering.					
	3	Completes and applies knowledge by using scientific methods by using limited or missing data and integrates information from different disciplines.				X	
	4	Be aware of new and developing practices of the profession, examines and learns when needed.					X
	5	Defines and formulates problems related to the field, develops methods to solve them and applies innovative methods in solutions.				X	
	6	Develops new and / or original ideas and methods, designs complex systems or processes and develops innovative / alternative solutions in their designs.				X	
	7	Designs and applies theoretical, experimental and modeling based researches, examines and solves the complex problems encountered in this process.					X
	8	Works effectively in disciplinary and multidisciplinary teams, leads such teams and develops solution approaches in complex situations, works independently and takes responsibility.			X		
	9	Communicates oral and written using a foreign language at least at the level of European Language Portfolio C1.		X			
	10	Conveys the process and results of the studies in written and oral form in a systematic and clear manner in national and international environments within or outside the field.					X
	11	Knows the social, environmental, health,	X				

		security, legal aspects of engineering applications; project management, and business life applications and be aware of the constraints of these engineering applications.					
	12	Considers social, scientific and ethical values in the stages of data collection, interpretation and announcement and in all professional activities.		X			
The Course's Lecturer(s) and Contact Information	Computer Engineering Department bmbb@gazi.edu.tr						