Course Description Form	
Course Code and Name	BDA5111 Big Data Analytics in Smart Grid
Course Semester	Fall/Spring
Catalog Content	Understanding the administrative and technical issues required for big data techniques, technologies, algorithms, platforms, issues, applications and implementation. Big Data perspective in smart grids. Smart Grid Communication Infrastructures, Cloud Computing, Security Applications, and implementations of smart grids.
Textbook	1. Smart Grid Communication Infrastructures: Big Data, Cloud Computing, and Security (Wiley - IEEE), Feng Ye, Yi Qian, et al. | Sold by: Amazon Digital Services LLC. 2. Smart Grid using Big Data Analytics: A Random Matrix Theory Approach by Robert C. Qiu and Paul Antonik | Sold by: Amazon Digital Services LL.
Supplementary Textbooks	1. Big Data Analytics Strategies for the Smart Grid, 1st Edition, Auerbach Publications; ISBN-10: 9781482218282, Carol L. Stimmel 2. Big Data Analytics, Venkat Ankam, Amazon Digital Services LLC
Credit	8
Prerequisites of the Course (*Attendance Requirements*)	There is no prerequisite or co-requisite for this course
Type of the Course	Elective
Instruction Language	English
Course Objectives	1. To teach basic concepts of big data 2. To teach concept of smart grid 3. Detailed investigation of big data to apply it to smart grids, 4. To increase awareness on data analytics 5. To increase applications and implementation capability to solve problems in the field of smart grids. 6. Ensuring a high level of data analytics 7. Improving awareness in our country
Course Learning Outcomes	1. Has the ability to analyze all the information assets it possesses in smart grid system. 2. Be able to systematically analyze SG related to information 3. Be aware of security and privacy issues 4. Improves the technical and behavioral competencies of all personnel in order to increase awareness of information security
Instruction Methods	The mode of delivery of this course is Face to face
Weekly Schedule	1. Smart Grid Communication Infrastructure 2. Design and Analysis of SG 3. Real-Time Management Systems 4. Intelligent Charging Units 5. Big Data and Big Data Perspective 6. Big Data Infrastructure 7. Big Data Programming 8. Big Data Analytics in SG 9. Cloud Computing in SG 10. A Secure Data Learning Schema for Big Data Application in SG 11. Big Data Applications and Implementations 12. Challenges in Smart Grid and Big Data Issues 13. Research and application projects 14. Research and application projects

Teaching and Learning Methods *(These are examples. Please fill which activities you use in the course)*	Weekly theoretical course hours Internet browsing, library work Designing and implementing materials 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 (%)		60
	Percentage of Final		40

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	0	0	0
	Studies	10	2	20
	Material Design and Implementation	10	2	20
	Report Preparing	8	4	32
	Preparing a Presentation	6	4	24
	Presentations	6	2	12
	Midterm Exam and Preparation for Midterm Exam	8	3	24
	Final Exam and Preparation for Final Exam	14	2	28
	Other (should be emphasized)	0	0	0
	Total Workload			202
	Total Workload / 25			8,08
	Course Credit (ECTS)			8

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 latest techniques, methods applied and their limitations in engineering.					X

					X	
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, security, legal aspects of engineering applications; project management, and business life applications and be aware of the constraints of these engineering applications.	X				
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	Prof. Dr. Şeref SAĞIROĞLU ss@gazi.edu.tr