Course Syllabus

Code - Course Title	**BVA226 - Data Analytics with Generative AI**
Course Type	IV. SEMESTER
Laboratory + Practice	2+2
ECTS	**4.0**
Language of Instruction	Türkçe
Course Type	Area Elective Courses
Course Instructor(s)	ÖĞR. GÖR. AHMET MÜCAHİD ARVASİ

Mode of Delivery	Face to face
Prerequisites	There are no prerequisites or corequisites for this course.

Course Syllabus

Weeks	Learning Outcomes	Topics	Teaching Methods
Week - 1		Introduction to Generative AI: Basic Concepts and Its Role in Data Analytics Processes	
Week - 2		Data Preparation 1: Automated Data Cleaning and Missing Data Imputation with Generative AI	
Week - 3		Data Preparation 2: Synthetic Data Generation Using GANs and Diffusion Models	
Week - 4		Exploratory Data Analysis (EDA): Statistical Summarization of Datasets with AI Assistants	
Week - 5		Automated Data Visualization: Dynamic Charts and Anomaly Detection via LLMs	
Week - 6		Text Data Analysis 1: Processing Unstructured Data and Information Extraction	
Week - 7		Text Data Analysis 2: Advanced Sentiment Analysis and Text Mining with LLMs	
Week - 8		Midterm Exam	
Week - 9		Predictive Modeling: Time Series Analysis and Trend Forecasting	
Week - 10		Scenario-Based Simulations: "What-If" Analyses with Generative Models	
Week - 11		Large Language Model Applications 1: Natural Language Querying for SQL and NoSQL Databases (Text-to-SQL)	
Week - 12		Large Language Model Applications 2: Automated Reporting from Analytical Results and Interactive Data Dashboards	
Week - 13		Ethics in Analytical Processes: Data Privacy (Anonymization of Personal Data) and Trustworthy AI	
Week - 14		Algorithmic Bias Management and End-of-Term Project Presentations	

Learning Outcomes

#	Learning Outcome
1	Upon successful completion of this course, students will gain the competence to integrate generative AI technologies into data science processes to perform synthetic data generation, missing data imputation, and automated data cleaning; they will be able to create autonomous visualizations, interactive dashboards, and comprehensive analytical reports from complex datasets and databases using natural language processing capabilities; furthermore, they will achieve the proficiency to analyze unstructured text data, design time series forecasts and scenario-based simulations while meticulously applying ethical standards such as data privacy and algorithmic bias.

Sustainable Development Goals

No content has been provided.

Course Theme

No content has been provided.

AKTS Workload

Activity	Duration (Hour)	Count	Workload
Teorik Derse Katılım	0	0	0
Sınıf Dışı Çalışma (Ön Hazırlık & Pekiştirme Amaçlı)	0	0	0
Ödevler	0	0	0
Proje - Rapor - Sunum Hazırlama	0	0	0
Ara Sınav Hazırlığı (sınav süresi dahil)	0	0	0
Final Sınavı Hazırlığı (sınav süresi dahil)	0	0	0
Uygulama (Laboratuvar, Müzik/Enstrüman Uygulaması, Atölye/Saha Çalışması vb.)	0	0	0
Staj Uygulaması	0	0	0
		Calculated ECTS	**0**

Assessment Method and Passing Requirements

No content has been provided.