HASAN KALYONCU UNIVERSITY
Electrical-Electronics Engineering Department
EE 499 Project Proposal Form

Part I. Project Proposer

Name Last name		**E-mail**	
		Date	

Part II. Project Information

Title of the Project	AI-Powered Digital Twin for Smart Energy Systems				
Maximum Cost of implementation (TL)	1500 - 2000 TL	**Conceptual Design Dead Line**	**in 7 weeks**	**Prototype Production Deadline**	**in 10 weeks**
Standards and licenses to be used in the project. example; IP65, IEEE, APACHE, MIT, etc.	IEEE 2030.5 (Smart Energy), ISO 50001 (Energy Management)				
Project Description					
The aim of this project is to develop a digital twin model for smart energy systems (batteries, solar cells, motors) using AI algorithms for fault prediction and consumption optimization.					
Project Justification					
Novelty					
New aspects	**End-to-End Learning: Integrates image feature extraction and sentence generation in a single model.**				
Complexity					
Challenging problem and issues	Data Availability: High-quality datasets like COCO are crucial but require significant computational resources for training. Long Training Time: Training deep neural networks, especially with both CNN and RNN components, requires high computational power (preferably GPUs or TPUs).				
Related electrical-electronics science fields and subfields	Deep Learning, Computer Vision, Natural Language Processing, and AI				
Tools	MATLAB/Simulink, Python (TensorFlow, PyTorch), IoT Sensors, Cloud/Edge platform.				
Risk involved					
Potential problems and alternative solutions					
Minimum work required	10 weeks, 2 developers				