

Faculty of Engineering, University of Rijeka,
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D_2.2-Assessment and analysis of the position of WB HEIs - UES

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UES

1. Study programs at FEE (UES)

Faculty of Electrical Engineering (FEE), as organizational unit of University of East Sarajevo (UES), has four study programs on the second study cycle (master level):

- Automation and Electronics
- Electric Power Engineering
- Computer Technology and Informatics
- **Renewable Energy Sources and Smart Grids**

All study programs last for one year (two semesters).

In the project proposal, UES will modernize existing study program “Renewable Energy Sources and Smart Grids” by introducing a few new courses and upgrading/updating a few existing courses.

2. Renewable Energy Sources and Smart Grids (curriculum)

O.N.	Subject name	Semester		
		I (IX)		
		LECTURES	EXERCISES	ECTS
1.	Elective subject EN - 1.1	3	2	6.0
2.	Elective subject EN - 1.2	3	2	6.0
3.	Elective subject EN - 1.3	3	2	6.0
4.	Elective subject EN - 1.4	3	2	6.0
5.	Elective subject EN - 1.5	3	2	6.0
	TOTAL	15	10	30

O.N.	Subject name	Semester		
		II (X)		
		LECTURES	EXERCISES	ECTS
6.	Student practice	-	-	6.0
7.	Research work	-	-	6.0
8.	Master thesis	-	-	18.0
	TOTAL	-	-	30

2. Renewable Energy Sources and Smart Grids (curriculum)

O.N.	Subject name EN-1.1, EN-1.2, EN-1.3, EN-1.4, EN-1.4, EN-1.5	Semester		
		I (IX)		
		LECTURES	EXERCISES	ECTS
1.	Electricity market	3	2	6.0
2.	Integration of RES in Power Grids	3	2	6.0
3.	Utilisation of Solar Energy	3	2	6.0
4.	Utilisation of Wind Energy	3	2	6.0
5.	Exploitation and Regulation of Smart Grids	3	2	6.0
6.	Energy Storage Systems	3	2	6.0
7.	Energy Efficiency	3	2	6.0
8.	Measurement and Monitoring Systems in Smart Grids	3	2	6.0
9.	System Modelling and Simulation	3	2	6.0
10.	IoT Infrastructure in Smart Grids	3	2	6.0
11.	Power Electronics Converters in Smart Grids	3	2	6.0
	TOTAL	33	22	66

3. New courses

O.N.	Subject name EN-1.1, EN-1.2, EN-1.3, EN-1.4, EN-1.4, EN-1.5	Semester		
		I (IX)		
		LECTURES	EXERCISES	ECTS
1.	Digital Relay Protection	3	2	6.0
2.	Microgrids	3	2	6.0
3.	Electric Vehicles and its role in Smart Grids	3	2	6.0
	TOTAL	9	6	18

Digital protection relays are now extensively deployed in almost every transmission system substation, and their implementation is rapidly expanding to distribution substations across the power system of Bosnia and Herzegovina. As the industry transitions from traditional electromechanical relays to advanced digital systems, there is an increasing demand for engineers proficient in digital relay technology. Integrating a course on digital relay protection into the study program is a strategic move to align our educational offerings with industry needs, enhance the technical skills of our students, and ensure their success in the evolving power system of Bosnia and Herzegovina.

Microgrids are expected to rise significantly in Bosnia and Herzegovina as distributed renewable energy sources, especially photovoltaic (PV) systems, are rapidly integrated into the national power grid. This transition towards decentralized and sustainable energy solutions necessitates engineers who are well-versed in the design, operation, and management of microgrids. By incorporating a course on microgrids into the study program, we ensure that students gain the necessary knowledge and skills to effectively work with these emerging systems. Integrating a course on microgrids into the study program is a strategic move to align our educational offerings with industry needs, enhance the technical skills of our students, and ensure their success in the evolving power system of Bosnia and Herzegovina.

Electric vehicles (EVs) are anticipated to play a crucial role in the advancement of smart grids, particularly as the integration of distributed renewable energy sources accelerates. As smart grids evolve to accommodate a higher penetration of renewable energy, the incorporation of EVs becomes increasingly important. This shift towards intelligent and sustainable energy systems requires engineers proficient in the design, operation, and management of smart grids and EV infrastructure. By including a course Electric vehicles and its role in Smart Grids within the study program, we ensure that students acquire the essential knowledge and skills to work effectively with these advanced systems. Introducing a course on this topic into the curriculum is a strategic initiative to align our educational offerings with industry demands, enhance the technical competencies of our students, and prepare them for successful careers in the dynamic energy sector.

3. Upgraded courses

O.N.	Subject name EN-1.1, EN-1.2, EN-1.3, EN-1.4, EN-1.5	Semester		
		I (IX)		
		LECTURES	EXERCISES	ECTS
1.	Electricity Market	3	2	6.0
2.	Measurement and Monitoring Systems in Smart Grid	3	2	6.0
	TOTAL	6	4	12

Integrating energy policy competencies into the existing course on the **electricity market** is essential due to the rapidly evolving energy policies in Bosnia and Herzegovina. This integration will ensure that students are well-prepared to understand and navigate the complex interplay between energy policies and electricity markets.

Including competencies related to smart meters and advanced metering infrastructure (AMI) in the **Measurement and Monitoring Systems in Smart Grid** course is essential due to the growing industry need in distribution networks in Bosnia and Herzegovina.



WB

Thank you
for
attention!