

Discipline	Electronic Systems for Renewable Energy Sources	code: 5519 Semester – /summer/
Specialty	Electronics	
ECTS credits: 7	Form of assessment: Exam	
Lecturer	Professor, PhD Vencislav Valchev Room: 612E Phone: +359 52 383 266 E-mail: venci.valchev@tu-varna.bg	
Department	Department of Electronics and Microelectronics	
Faculty	Faculty of Computer Sciences and Automation	
Learning objectives		
<p>The course "Electronic Systems for Renewable Energy Sources" aims to acquaint students with the various electronic systems used in RES, as well as to make a brief presentation on the main methods of generating energy from RES. Various electronic and power converters and data collection systems related to RES are examined. Emphasis is placed on applications related to solar and wind energy. Basic concepts related to fuel cells, thermoelectrics, and piezoelectrics are also presented.</p>		

CONTENTS:		
Training Area	Hours lectures	Hours seminar exercises
Renewable energy sources - definition, basic concepts and types.	2	2
Wind energy - conversion, types of wind generators and their components.	2	2
Electronic systems for measurement, analysis and study of wind parameters.	2	2
Power electronic converters for managing the electric energy produced by wind generators using synchronous, asynchronous, and asynchronous wound rotor machines.	6	6
Specialized power electronic converters for wind generators - passive converters.	2	2
Electric brakes for wind generators.	2	2
Solar energy - conversion, types of systems and their components.	2	2
Electronic systems for measurement, analysis and study of solar energy.	2	2
Electronic converters for managing the energy generated by photovoltaics.	2	2
Electronic converters for connecting photovoltaic installations to the power grid	2	2
Specialized electronic systems for implementation of electronic converters for photovoltaic installations	2	2
Fuel cells - definition, principle of operation, types and application	2	2
Other energy converters - thermoelectric generators, piezoelectric generators, pyroelectric generators	2	2
TOTAL: 60 h	30	30