Study program: Environmental Protection

Course title: Renewable Sources of Dispersing Power

Professor/assistant: Dejan R. Blagojević

Type of course: elective

ECTS credits: 6

Pre-requisites: -

Aims of the course:

Prepare students to: introduce with the importance, types, problems, principles, and methods of preparation, transfer and exploitation of renewable energy sources, as well as place and role of these sources in the future, adequately apply the acquired knowledge.

Learning outcomes:

Student will be able to: apply knowledge in practical application in the future engineering practice in the areas of environmental protection, as well as within the procedures of spatial planning, implement PV systems in dispersive regions.

Syllabus

Theoretical part

Energy and power systems. The analysis of energy systems and energy balance. Conventional and renewable energy sources. Energy and ecology. Green kilowatts available data. The conversion of renewable energy sources into electricity. Characteristics of the generator and converter losses conversion. Solar energy, resources, technology PV system. Solar thermal electric systems. Organic solar cells. PDF function. Wind turbines - windmills. Variation of the power spectrum of wind speed. Energy waterways. Small hydro power plants. Review of other renewable energy.

Practical part

The analysis of energy systems and energy balance. Conventional and renewable energy sources. Energy and ecology. Available data. The conversion of renewable energy sources into electricity. Characteristics of the generator and converter losses. Conversion, resources and technology of PV systems. Monocrystalline and polycrystalline solar panels, databases, components of PV systems, controller of chargers , inverters and losses on invertors. The principles of designing PV systems in dispersive environments. Organic solar cells. Wind energy share, sources of variability, PDF function. Wind turbines - windmills. The variation of the power spectrum of wind speed. Energy waterways. Small hydro power plants. Combined sources of energy. Distribution and control of energy flows. On grid and off grid systems.

Literature

1. B. Sorensen, *Renewable Energy Conversion, Transmission, and Storage***,** Elsevier, 2007.
2. M. Babić, N. Lukić, *Solarna energija*, Mašinski fakultet Beograd, 2008
3. M. Lambić, D. Stojićević, *Solarna tehnika*, Srbija Solaar, 2004

Number of active classes			Other forms of teaching:
Lectures: 2	Practical classes: 2	Research work:	

Teaching methods

Combined- interactive approach with practical problem solving.

Grading system (maximum 100 points), **grading scale** from 5 to 10: below 51 points grade 5, grade 6 from 51-60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91-100 points.

Pre-exam obligations	**points**	**Final exam**	**points**
activity during theoretical lectures	**10**	written exam	**40**
practical training	**10**	oral exam	**-**
colloquium(s)/seminar papers	**40**		
Sum	**60**	**Sum**	**40**