

Subject name	Technologies in Renewable Energetics	
Subject code	E.1.TRE.SC.ECTIE.A	
Department	Institute of Agricultural Engineering and Computer Science	
Faculty	Faculty of Production and Power Engineering	
Subject supervisor/Lecturer	Hubert Latała Ph.D.	
General information	Teaching period	Winter semester
	ECTS credit	6
	Lectures total	15
	Lab practical	15
Objective and general description	Course content: the principles of designing, implementing and maintaining renewable energy sources. Main activities of the students: learning the practical skills during implementation of: heat pump, solar collectors, photovoltaic cells.	
Lectures 5 x 3 hours	<ol style="list-style-type: none"> 1. Revivers of renewable sources. 2. Device and construction of: heat pump, solar collectors, photovoltaic cells. 3. Parameters to calculate renewable technical device: coefficient of performance, efficiency. 4. Engineering calculating to estimate of heat and electricity produced by analysed devices. 	
Lab practicals 5 x 3 hours	<ol style="list-style-type: none"> 1. Efficiency calculating of solar collectors. 2. Calculating of amount heat produced by heat pump. 3. Calculating of electricity produced by photovoltaic cells. 4. Projects with using of solar collectors and heat pump to cover heat requirement by greenhouses. 	
References	<ol style="list-style-type: none"> 1. Bakker J.C., Bot G.P.A., Challa H., Van de Braak N.J.: Greenhouse climate control an integrated approach. Wageningen Pers, Wageningen, 1995 2. Denton J.C., Afgan N.H.: Future energy production systems. Transfer Process. Vol 1, Academic Press, New York. 1999. 3. Kurpaska S., Latała H.: Energy analysis of heat surplus storage systems in plastic tunnels. Renewable Energy (in Press). 	