

Course Unit Descriptor

Study Programme: Energy and Process Engineering			
Course Unit Title: Nonconventional Heating and Refrigeration Systems			
Course Unit Code: M3410			
Name of Lecturer(s): Anđelković Aleksandar			
Type and Level of Studies: Master Academic Degree			
Course Status (compulsory/elective): compulsory			
Semester (winter/summer): summer			
Language of instruction: english			
Mode of course unit delivery (face-to-face/distance learning): face-to-face			
Number of ECTS Allocated: 4			
Prerequisites: none			
Course Aims: Introduction to nonconventional heating and cooling systems and saving measures in consumption of energy sources. Development of engineering approach in designing and system operations.			
Learning Outcomes: Acquiring knowledge for carrying out elaborate, studies and projects,as well as cration of non conventional systems of heating and cooling. Knowledge application in further education and practical work			
Syllabus: Nonconventional heating and cooling systems, general terminology, comparison to convetional systems. Fundamental parts of systems. Relevant factors for application of non conventional heating and cooling systems, climate conditions, urban planning, degree of economical development of the country. Regenerational thermal sourses, earth, water, air. Solar energy, other renewable energy sources, Solar energy, application principles, devices for solar energy utilization. Systems for solar energy application. Heating systems with thermal pump. Temperature state systems. System and regulation management. Foundation preparation for system designing. Technological and economical analysis of application of non conventional heating and cooling systems.			
Required Reading: Relevant literature in English TBD			
Weekly Contact Hours: 4	Lectures: 2	Practical work: 2	
Teaching Methods: Lectures, practical classes, consultations and instalation and plant visits. Theoretical part is presented in lectures with practical examples. Practical classes cover computer examples in designing and realized solutions. Additonal clarifications are offered in consultations.			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	Final exam	points
Lecture attendance	5	Written part of the exam	70
Exercise attendance	5		
Project defense	10		
Homework	10		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			

