

Study program: Industrial Engineering			
Course title: CCH systems			
Professor/assistant: Ph D Biljan Milutinovic			
Type of course: elective			
ECTS credits:5			
Pre-requisites:			
Aims of the course: Prepare a student to: - apply the CCH system design methodology, - recognize and analyze the elements of the CCH system and their functionality, - recognize the problems in operation of CCH system elements.			
Learning outcomes: The student is able to: - determine the hygienic requirements for heating, cooling and air conditioning of premises; - design CCH systems in accordance with the needs of space thermal comfort; - identify the basic elements of CCH systems; - choose the appropriate CCH system for a particular facility, - eliminate problems in system operation.			
Syllabus			
<u>Theoretical part</u> Meteorological basics. Basics of hygiene. Basics of fluid mechanics and heat transfer. Basics of metering and heating, heating system components, cooling system, components and the cooling systems. Calculation and dimensioning of the heating and cooling systems. On ventilation and air conditioning. Ventilation and air conditioning systems. Ingredients (fans, heaters, filters, air humidifiers, noise reduction, air distribution, recuperates, fire protection). Calculation of air conditioning systems.			
<u>Practical part</u> Mostly, practical classes follow the lectures, while the study materials enriched by using practical examples. Seminar papers and visits to firms provide excellent preparation for the final exam on which the student shows the knowledge he/she acquired and the skills he/she developed.			
Literature 1.S. Zrnić, <i>Grejanje i klimatizacija</i> , 1972. 2.Grupa autora, <i>Grejanje, klimatizacija, hlađenje</i> , 2005. 3.M. Lambić, Eremić, <i>Tehnička termodinamika</i> , 1995. 4.M. Bogner, <i>Termotehničar</i> , SMEITS, 2004.			
Number of active classes			Other forms of teaching:
Lectures: 3	Practical classes: 2	Research work:	
Teaching methods Teaching is performed interactively in the form of lectures, auditorial, laboratory and computer exercises. In lectures, theoretical part of the material is presented together with characteristic examples for easier understanding. Computer-based exercises make upgrading of information communication technologies to possible to master the knowledge of the observed area. In addition to lectures and exercises, consultations are also held regularly.			
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	5	written exam	30
practical training	5	oral exam	
colloquium(s)/seminar papers	40+20		
Sum	70	Sum	30