

14MEIP- Heat and Process Integration

Course specification		
Course title	Heat and Process Integration	
Acronym	14MEIP	
Level	BSc & MSc	
Study programme	/	
Module	/	
Lecturer (for classes)	prof. dr Mirjana Kijevcanin	
Lecturer/Associate (for practice)		
Lecturer/Associate (for OTC)		
ESPB	4.0	Status
Condition	-	
The goal	The aim of the course is to provide fundamental understanding of the methods of process and energy integration, and capital and operating cost minimisation, based on the analysis of energy efficiency of the chemical and process plants, as well as with cleaner production concept implementation.	
The outcome	Students gain knowledge necessary for the: developing of the methodology for the identification of the strategies for using renewable and other energy sources, energy analyses of the existing process equipment and the whole process, particularly in terms of increasing energy efficiency compared to existing solutions in the process industries (processes energy conservation) and the reduction of thermal environmental pollution.	
Contents		
Contents of lectures	Thermodynamic process analysis (thermodynamic model selection and determination of appropriate parameters). Analysis of process heat and material balances - comparison with real process parameters. Energy analysis of process equipment application of direct and indirect heat pump in distillation. Process model verification, sensitivity analysis and optimization. Energy and process network synthesis-energy conservation and thermal energy management. Introduction and implementation of cleaner production principles (increase of the energy efficiency of equipment and processes, consumption of raw and auxiliary fluids reduction, etc.).	

Contents of exercises	Computer simulations that follow the theoretical classes (determination of appropriate process parameters; simulation of process and heat integration) and seminars.			
Literature				
Literature:				
1. R. Smith, Chemical Process Design and Integration, Wiley, New York, 2014.				
2. B. Linnhoff, D.W. Townsend, D. Boland, G. F. Hewitt, B.E.A. Thomas, A. R. Guy and R. H. Marsland, User Guide on Process Integration for the Efficient Use of Energy, IChemE, UK, 1994				
3. M.M. El-Halwagi, Sustainable Design through Process Integration: Fundamentals and Applications to Industrial Pollution Prevention, Resource Conservation, and Profitability Enhancement, Elsevier, 2017				
Number of hours per week during the semester/trimester/year				
Lectures	Exercises	OTC	Study and Research	Other classes
3 (1+2)				
Semester	Fall & Spring Semester			
Methods of teaching	Lectures (ppt presentations) and practical part (simulation using software for heat integration)			
Assessment methods	Seminar and exam			
Mode of Teaching	Distant (remote) / On site (physical)			
Language of instruction	Serbian and English			
Prerequisites	Knowledge of English language			
Knowledge score (maximum points 100)				
Pre obligations	Points	Final exam	Points	
Activities during lectures		Test paper		
Practical lessons		Oral examination	40	
Projects				
Colloquia				

Seminars	60	
----------	----	--

- [Facebook](#)

Karnegijeva 4, 11120 Belgrade, Serbia |E-mail: tmf@tmf.bg.ac.rs |[Contact](#)