UNIVERSITY OF PANNONIA

COURSE DATASHEET

Semester:	2014/15/2
Course:	Process Design 2
Code:	VEMKEL3153A
Responsible department:	Department of Hydrocarbon and Coal Processing
Department code:	MKOL
Responsible instructor:	Csilla Varga

Course objectives:

Development of ability for recognising the technical and economic aspects of the chemical processes for process design and intensification, for transformation and utilisation of existing equipments by the means of theoretical knowledge of chemical engineering and design softwares

Course content:

1. E.: Goal of heat exchanger network design.. L.: Preparation of simulation flowsheet. 1. E.: Basic data for heat exchanger network (HEN) design. Determination of external heat requirement. Composite curves. L.: Preparation of simulation flowsheet. 2. E.: HEN design for maximum energy recovery. Concept of minimal heat exchanger number. L.: Basics of PRO/II. 2. E.: HEN design for maximum energy recovery. Concept of minimal heat exchanger number. L.: Basics of PRO/II. 2. E.: HEN design for maximum energy recovery. Concept of minimal heat exchanger number. L.: Basics of PRO/II. 2. E.: HEN design for maximum energy recovery. Concept of minimal heat exchanger number. L.: Basics of PRO/II. 3. E.: HEN design for minimum number of units. L.: Basics of PRO/II 4. E.: Minimum network surface area. HEN design for minimum network surface area. L.: Simulation of a given technology. 5. E.: Determination of optimal ?Tmin. L.: Simulation of a given technology 6. E.: Utility systems. Multiple utility targeting with grand composite curve. L.: Simulation of a given technology 7. E.: Integration of heat engines and heat pumps. L.: Determination of surface area requirement, energy requirement, capital cost and operation cost of HEN without process – process heat exchange. I. 8. E.: Retrofit. L.: Determination area requirement, energy requirement, capital cost and operation cost of HEN without process – process heat exchange. II. 9. E.: Examination papers L.: Example. 10. E.: Goal of sizing, considerations. Different types of heat transfer: heat conducting, haet transfer, heat radiation. Direct and indirect heat exchange. L.: HEN design for maximum energy recovery. 11. E.: Types of heat exchangers, different parts of heat exchangers, TEMA classes. Regenerative, recuperative, direct mixing heat exchangers. Application of various types. L.: HEN design for maximum energy recovery. 12. E.: Determination of corrected LMTD. Single phase and multi phase heat transport. Single phase heat transport, calculation methods of heat transfer coefficient both on tubeside and shellside. Boiling heat transfer, types of boiling, correlation methods for estimation of heat transfer coefficient. L.: HEN design for maximum energy recovery. Determination of optimal ?Tmin. 13. E.: Calculation of pressure drop. L.: Determination of optimal ?Tmin 14. E.: Example. L.: Determination of HEN with grid diagram. 15. E.: Examination papers. L.: Examination papers

Requirements, evaluation and grading:

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Required and recommended readings:

1. Linnhoff, B. et al.: User Guide on Process Integration for the Efficient Use of Energy, 1994, IChemE, Rugby, UK. 2. A Guide to Pinch Technology. Linnhoff March, 1998. 3.. Felber Gábor: Eljárástervezés III. 1995. Egyetemi jegyzet 4. Turton, Baille, Whithing, Shaeiwitz: Analysis, Synthesis, and Design of Chemical Processes, 2003, Prentice Hall 5. Seider, Seader, Lewin: product and Process Design Priciples, 2004, Wiley 6. Smith, R.: