UNIVERSITY OF PANNONIA

COURSE DATASHEET

Semester:	2013/14/1
Course:	Design of Process Systems
Code:	VEMKFOB212T
Responsible department:	Department of Process Engineering
Department code:	MKFO
Responsible instructor:	Dr. Tamás Varga

Course objectives:

An introduction to the conceptual design for chemical engineers and the acquirement of the theoretical and practical basics for the application of this approach.

Course content:

1. The nature and methodology of systems design: the role of systems approach and systems engineering in the work of a chemical engineer, basic principles, decision models, evaluation functions of the decisions 2. Anatomy of technological systems: continuous, discrete and batch technologies; … 3. Phases of the systems design: conceptual, preliminary and detailed design 4. The steps of the detailed design and development 5. Batch processing systems: properties, applications, process design and planning of events, concepts of flexibility and uncertainty 6. Design of batch processing systems: layout and scheduling problems 7. The role of intermediate storages in batch processing systems 8. Design of flexible processing systems: concepts of reliability, analysis of risk 9. The concept of conversion subsystem 10. Basics of design of chemical reactors: short cut, reduced and detailed design models 11. Homogeneous chemical reactors and reactor systems 12. Heterogeneous chemical reactors and reactor systems 13. Fluidized bed chemical reactors 14. Thermal properties and stability of chemical reactors 15. Selection of reactors based on a multi-scale decision system

Requirements, evaluation and grading:

Grading is based on one written midterm examination and one written final examination. Each written examination consists of 1-2 examination questions and 2-4 problems to be solved. The final mark is determined according to following table based on the weighted average of the points obtained for the midterm and the final written examination (ratio of midterm and final exam weights=0.33/0.67): % final mark above 85 excellent (5) 75-84 good (4) 65-74 medium (3) 50-64 pass (2) below 50 fail (1)

Required and recommended readings:

Lakatos B., Rendszertechnika, rendszertervezés. Jegyzetvázlat. Veszprémi Egyetem, Veszprém. Biegler, L.T., I.E. Grossmann & A.W. Westerberg, Systematic Methods of Chemical Process Design. Prentice Hall, Upper Saddle River, New Jersey. Blanchard, B.S. & W.J. Fabrycky, 1998, Systems Engineering and Analysis. (3rd Edition). Prentice Hall, Upper Saddle River, New Jersey. Denbigh, K.G. & J.C.R. Turner, 1971, Kémiai reaktorok. Műszaki, Budapest. Froment, G.B. & K.B. Bischoff, 1979, Chemical Reactor Analysis and Design. John Wiley, New York. Sinnott, R.K., 1993, Chemical Engineering Design. Coulson and Richardson's Chemical Engineering, Volume 6., Pergamon Press, Oxford