COMPUTER MODELLING OF TECHNOLOGICAL PROCESSES

(2 ECTS) *Compulsory*

Responsible person: Dr. inż. Grzegorz S. Jodłowski

The aim of the subject is to obtain knowledge on basics and modern technics of technological process modelling. Students learn how to transform elemental technological process or whole production line into computer data space using well known techniques. Students are introduced to the application of advanced computer tools containing data sheeting methods.

Learning outcomes:
Base skills of the subject:
computational transcription of physical model;
projecting of computational description of the unit;
projecting of computational description of whole process;
application of approximation, optimisation and simulation techniques;
construction of physical process model;
methods of model evaluation;
using standard applications (spreadsheet) for process description;
application of flowsheets and flowcharts for process analysis and control.

Additionally a student obtains the general knowledge on data acquisition, data mining and process control.

Course main content: computer laboratory/conversatory (30 h)

Elemental operation and technological process. Computer aided calculation – methods. Optimization and simulation. Methodology of model choice. Methods of model evaluation. Study of the case: model assumption, construction and evaluation. Data-expert system. Data acquisition. Methods of process control. Elemental operation description in classical sheeting program (MS Excel, Origin, etc.). Flowchart diagram of the process. The chosen methods of calculation programming (iteration, approximation etc.). Flowcharting and Flowsheeting.

Literature
1. Westerberg A. W., Hutchinson H. P., Motard R. L., and Winter P., (1979), "Process Flowsheeting", Cambridge Universities Press
2. Rhodes C.L., "The Process Simulation Revolution: Thermophysical Property Needs and Concerns", J.Chem.Eng.Data, 41, 947-950, 1996
3. Veverka V. V., and Madron, F. (1997), "Material and Energy balancing in the Process Industries", Elsevier
4. Gani R., Pistikopoulos E.N., "Property Modelling and Simulation for Product and Process Design″, Fluid Phase Equilib., 194-197, 43-59, 2002
5. Babu, B. V.(2004), „Process Plant Simulation" , Oxford Universities Press
6. McCabe, W., Smith, J. and Harriott, P. (2004). Unit Operations of Chemical Engineering (7th Edition ed.). McGraw Hill.

Assessment:
Evaluation of the project.