**Topics to study for the PCA course exam – Summer Term 2012**

1. Number systems, codes, signals - fundamentals
2. Boolean operations – fundamentals
3. Boolean functions – advanced
4. Sequential functions and circuits
5. Clock-Mode Sequential Machines
6. Gas burner start up - an application example
7. Petri Nets
8. Reaction tank – an application example
9. Logic systems with memory function in the PLC
10. Most important PLC producers, families of PLCs, HMI, visualization of technological processes
11. Sequence control systems, function chart
12. Timers, counters in the PLCs
13. Tools for the behaviour analysis of the sequential systems
14. PLC – internal stucture, mode of operation, scan, input image, output image
15. IEC 1131-3 – languages for PLC programming (Ladder Diagram, Function Block Diagram, Instruction List, Structured Text, Sequential Function Chart) – overview
16. PLC Simatic S7-200 – HW features, experiences from the term project
17. Software environment for PLC S7-200 programming - Step 7-MicroWin – features, experiences from the term project
18. Term project –controlled technological process (facility) analysis, control system synthesis, simulation in FluidSim, physical model control with the PLC, experiences, documentation of the project