Synthetic bio-tools for industrial biotechnology (45 h laboratory, 4 ECTS)

The aim of the course is to gain experience in microbial protein expression, protein design and engineering, recombinant protein purification, standard protein analysis methods, and activity assays.
Student will have ability to independently design and execute informative experiments and interpret results. This course will prepare a student for a position of a protein scientist in R&D sector.
Lectures and practical course will focus on troubleshooting.

1) Synthetic systems design and engineering (synthetic biology, molecular biology, promoter types, tag systems, functional domains ect.)
2) Expression (protein stability, secretion machinery)
3) Purification (broaden spectrum of techniques in affinity chromatography)
4) SDS-PAGE and Western-blot (visualization techniques, labelling)
5) EMSA assay (protein-DNA interactions assays in molecular biology and biophysics)

Each group of students will be given a different synthetic construct (or will be asked for designing its own). Students will have to recognise the overproduced and purified proteins as well as to perform on them activity tests.