| **Name of the course** | **Engineering of particulate systems** |
|---|---|
| Number of instruction hours | 20 |
| Outline of course/module content | Introduction: Particle characterization. Population balances in particulate systems transformation.<br>Analysis of particle transformation and separation processes: comminution, agglomeration, deep-bed filtration.<br>Theoretical background on comminution. Fragmentation mechanisms: fragmentation mechanisms in general, mathematical description of fragmentation mechanism. Comminution kinetics: matrix approach, population balance equations, modification of the population balance equation according to the process terms and mill types. Selection function, breakage functions, method of determining the kinetic parameters, selection of models for kinetic parameters estimation. Defining a dominant mechanism.<br>Theoretical background on granulation, different types of process, population balance modeling. Physical processes and mechanisms.<br>General characteristics of deep-bed filtration. Mechanisms of deep-bed filtration, filtration with chemical pretreatment. Designing a depth filter. Macroscopic description and simulation of deep bed filtration. Optimization of deep-bed filtration.<br>Equipment types and selection in various industries. |
| Description of instruction methods | Lectures, consultations and seminars. |
| Description of course/module requirements | Oral exam and seminar paper. |