

## **The Optimization of the production program, the production resources and the production processes as an integral part of the adaptation planning for metal-cutting manufacturing systems within the flow production of aggregates**

### **Abstract:**

Because of increasingly dynamic and uncertain markets producing companies, or at least some departments of them with a high investment volume, are facing the challenge to produce in an economical way, even at unexpected market conditions. This calls for an implemented adaptation planning in early phases of the whole planning process for manufacturing systems. Adaptations of a manufacturing system can basically affect three different sectors: the production program, the production resources and the production processes. The thesis at hand focuses on two different levels of the planning process: on the one hand there is the planning level of the production program and the production resources, which can be seen as a kind of rough planning of manufacturing systems; on the other hand there is the level of the resources and the processes, which handles the production resources and the process chain in detail. For both levels there are developed mathematical optimization models to minimize the overall manufacturing expenses including the adaptation costs by simulating and applying different market conditions in order to avoid severe misinvestments.