**Automotive Process Analysis and Planning I**

Code: MK3JFT1G04G317-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 3rd year, 1st semester

Its prerequisite(s): Introduction of Mechanical Engineering

Further courses are built on it: Yes/No

Number of teaching hours/week (lecture + practice): 2+1

**Topics**:

The goal of the subject is to develop a process-oriented view in the students. During the lectures and practices the students get acquired with the operation management and the processes of a company. They acquire the methods of process development. During the practices they get routine in data collection techniques as well as process analysis and valuation.

General properties of production processes. Key indicators to represent the operation of a productive system. Components of operational management. Sorting of various processes. Product life cycle stages. The product-process matrix. Forecast, constant- and trend demands. Short term and long term capacity planning. Inventory management. Determination of the optimal product mix, determination of the optimal level of resources. Calculation of the resource demand. Principles of JIT production.

**Literature:**

*Compulsory:*

* William J. Stevenson: Operations management 10th ed. Boston : McGraw-Hill/Irwin

*Recommended:*

* James P.W.: Lean thinking, Free press, 2003

**Schedule**

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| **1st week Registration week** |
| **2nd week:** **Lecture:** Evolution of operation management. General properties of production processes.**Practice:** Introduction to the methods of process analysis. Simulation in teamwork. | **3rd week:** **Lecture:** Key indicators to represent the operation of a productive system. Relationship between the key indicators **Practice:** Case-study: properties of production processes. |
| **4th week:** **Lecture:** Components of production- and operational management. Functions of production and management.**Practice:** Case-study: relationship between the key indicators. | **5th week:** **Lecture:** Sorting of various processes based on volume of production. Product life cycle stages.**Practice:** Elaboration of calculation exercises in the field of sorting of various processes. |
| **6th week:** **Lecture:** Production-strategies. The product-process matrix. Factors defining the competitiveness of a production system. **Practice:** Relationship between the product life cycle stages and the tasks of the operation management. | **7th week:** **Lecture:** Typology of forecast. Constant- and trend demands. Failures of forecast.**Practice:** Methods of forecast |
| **8th week: 1st drawing week** |  |
| **9th week:** **Lecture:** Capacity planning techniques.Short term and long term capacity planning.**Practice:** Elaboration of calculation exercises in the field of capacity planning  | **10th week:** **Lecture:** Inventory management. Classical mechanisms of inventory. Sensitivity analysis.**Practice:** Elaboration of calculation exercises in the field of capacity planning |
| **11th week:** **Lecture:** Inventory management. Determination of the safety stock. The “make or buy” decision**Practice:** Elaboration of calculation exercises in the field of Inventory management  | **12th week:** **Lecture:** Determination of the optimal product mix, determination of the optimal level of resources.**Practice:** Elaboration of calculation exercises in the field of Inventory management  |
| **13th week:** **Lecture:** Calculation of the resource demand. The basics of Material Requirements Planning**Practice:** Elaboration of calculation exercises in the field of Material Requirements Planning | **14th week:** **Lecture:** Principles of JIT production. Control of material flow. Pull-principle.**Practice:** Test |
| **15th week: 2nd drawing week** |

**Requirements**

**A, for a signature:**

Participation at **practice** is compulsory. Student must attend the practices and my not miss more than three practice during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. If student’s behaviour doesn’t meet the requirements of active participation, the teacher may evaluate their participation as an absence due to the lack of active participation in class.

During the semester there is one test in the 14th week.

**B, for grade:**

The course ends in **exam.**