Preparation Master OML (non IE)

Preparation Master OML (non IE)		
Offered by	Department of Industrial Engineering and Innovation Science	
Language	English	
Primarily interesting for	All students except for major students Industrial Engineering	
Not allowed for	Major students Industrial Engineering	
Prerequisites	See overview Prerequisites below	
Contact person	Dr. M. Slikker (M.Slikker@tue.nl)	

Content and composition

This choice package is intended for non-IE students (IE stands for Industrial Engineering). It prepares you for the master Operations Management and Logistics (OML). You choose (at least) 3 of the 5 courses that constitute this package and you can join OML more easily (perhaps without a pre-master program). Within the OML master there is sufficient room (maximum 15 ECTS) to take the remaining courses that are required as prior knowledge for the master OML. The admission board OML decides on any deficiency courses that you will have to follow.

Course code	Course name	Level classification
1JK00	Management of human behavior in organizations (non-IE)	1. Introductory
1CV10	Fundamentals of financial and management accounting	1. Introductory
2DD50	Mathematics 2	3. Advanced
1CK50	Production and inventory control (non-IE)	3. Advanced
1-out-of-2:		
1BV00 or	Fundamentals of business information systems	1. Introductory
1BK50	Algorithmic programming for operations management	3. Advanced

Prerequisites:

For 2DD50 Mathematics 2:

• Basic knowledge in probability theory and statistics

For 1CK50 Production and inventory control (non IE):

- Basic knowledge in probability theory, queuing theory, and mathematical programming.
- Statistics and Mathematics 2 (recommended)
- For 1BK50 Algorithmic Programming for Operations Management:
 - 2DD50 Mathematics 2 (recommended)
 - 1BV10 Design of business information systems (recommended)

No prior knowledge required for

- 1JK00 Management of human behavior in organizations (non IE)
- 1CV10 Fundamentals of financial and management accounting
- 1BV00 Fundamentals of business information systems

Order within the package

There are no order requirements in this package.



Course descriptions

1JK00, Management of human behavior in organizations (Non-IE)

This course aims to demonstrate and transfer some introductory knowledge about human behavior in organizations. Also, it will provide practical guidelines for a better functioning of both managers and technical specialists. Finally, it will increase engineers' sensitivity for both the central and the subtle roles people play in organizations, which use state-of-the-art technologies.

Content

General: This course is about the human factor in all types of organizations. The focus is on phenomena which are the result of psychological processes in organizations. This is of some practical relevance, since adequate decision-making of both managers and technical specialists appears to be an important success factor as crucial as technical 'know-how' is in their daily jobs.

1CV10, Fundamentals of Financial and Management Accounting

Focus of this course is on companies in terms of goods and cash flows. Goods flow through a company from suppliers to customers. These goods flows cause cash flows in the opposite direction, from customers to suppliers of production resources. The success of a company is measured, amongst others, by the amount of profit gained by the activities. Important topics are consequently: (relevant) costs, cost calculations, revenues, and financial performance and position

2DD50, Mathematics 2

Part Optimization:

Introduction to the mathematical modeling of optimization problems, in particular linear optimization problems. The main focus is on solution methods, and hence not on the modeling itself. Goal is that at the end of the course students are able to see which kind of problems can in principle be solved, which is a very important aspect in the formulation of practical problems. It does not make sense to formulate a model for a practical problem which cannot be solved eventually. During the course the student hence will become familiar with solution methods for in particular linear optimization problems. Besides that, also attention will be paid to problems for which the solutions have to be necessarily integer valued.

Part Stochastic Operations Research:

The student is able to formulate a discrete-time Markov chain, a continuous-time Markov chain and a queueing model for relatively simple practical situations. For discrete-time Markov chains, the student can calculate transient and limiting distributions, short-term and long-term costs and first passage times. For continuous-time Markov chains, the student can calculate the limiting distribution, long-term costs and first passage times. The student can apply the renewal-reward theorem in order to calculate the long-term cost rate in renewal processes. The student can calculate and interpret several performance measures in a number of queueing models.

1CK50, Production and inventory control (non-IE)

In this course basic concepts and techniques in inventory management and production planning are introduced. Upon successful completion of the course, the student should be familiar with the analysis and modeling of inventory management and production planning systems. *Content:*

Functional classifications of inventories, forecasting methods, deterministic inventory models, stochastic inventory models, framework for production planning, aggregate production planning, material requirements planning, production scheduling, project scheduling.

Preparation Master OML (non IE)

1BV00, Fundamentals of business information systems

Modern organisations need information systems to support their internal operations and their interactions with external parties (suppliers, customers, competitors, government, etc). Business processes and information systems are interwoven: changing a business process results in changing the information systems supporting it and vice versa. It is therefore important that students are able to model the complex relation between business processes and information systems. In this relation, data and process models play a key role. A data model specifies which data of the business process the supporting information systems should collect, store and manipulate. A process model specifies the steps in the business process and their interdependencies that have to be supported by the information system. Both types of model can be used to develop or configure information systems that support business processes.

1BK50, Algorithmic Programming for Operations Management

After successfully completing this course, the student:

- understands the following programming constructs:
 - variables and types,
 - o operators,
 - o conditional statements,
 - o loops,
 - o methods,
 - o parameters,
 - data structures;
- can apply these constructs, to create algorithms that solve practical operations management problems, such as: loading data from a file system and from the web, preparing data for further processing (filtering and transforming data elements), writing results to a report and posting results to a repository;
- can programmatically integrate existing tools and libraries for solving practical operations management problems, such as: configuring and invoking a data analysis library and interacting with a simulation program;
- can demonstrate by means of an automated test suite to which degree algorithmic correctness has been verified.