Material Handling and Logistics

Code: MK3AMLOG04G117-EN, MK3AMLOG04G317-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 3rd year, 2nd semester

Its prerequisite(s):

Further courses are built on it: Yes/No

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

Topics:

Basic concepts for the handling and conveyance of materials. Classification of material handling systems. Fundamental elements of material handling systems. Properties of handled materials. Basic calculations of continuous operating materials handling equipment. Belt conveyors, bucket elevators, screw conveyors, overhead conveyors, roller conveyors and pneumatic conveyors. Hoisting machinery. Simple hoisting appliances. Crane crabs and trolleys. Overhead cranes. Gantry cranes. Jib cranes. Loader machinery. Loaders for piece-goods, powered industrial trucks and forklifts. Loaders for bulk materials, continuous operating loaders, bucket loaders. Introduction to warehousing principles and technologies. Automatic storage warehouses with high racks and their equipment. Stacker cranes.

The connection between the logistics and the supply chain. The 7 rights of the logistics. The aims of company logistics. Company logistics system (strategic level, tactical level, operative level). The divisions of logistics (procurement, production, distribution, re-cycling). Supplier and distributer networks. Supply chain management. Procurement logistics. Centralized and decentralized procurement. Direct and indirect purchasing. The process of purchasing. Methods used by purchasers; demand analysis (ABC and XYZ analysis), price analysis, supplier evaluation and selection, economic order quantity (EOQ). Production logistics. Production systems. Push and pull type production systems. Material requirement planning (MRP). Manufacturing resource planning (MRP II.). Distribution logistics. Distribution requirements planning (DRP). Re-cycling logistics. Packaging technology. Dangerous goods.

Literature:

Compulsory:

- Martin Christopher (2011): Logistics and Supply Chain Management, Financial Times Series, 4th edition
- Lars Bedey, Sofia Eklund, Nojan Najafi, William Wahrén, Karl Westerlund (2008): Purchasing Management, Chalmers, Department of Technology Management and Economics, http://publications.lib.chalmers.se/records/fulltext/90488.pdf

Recommended:

- Peter Nyhuis, Hans-Peter Wiendahl (2009): Fundamentals of Production Logistics, Springer, ISBN 978-3-540-34210-6
- DiCentral (2014): Inventory and Warehouse Managemenet Best Practices, SmartTurn Inc., 1st edition, http://www.smartturn.com/pdf/inventory-warehouse-management-best-practices-ebook.pdf

Schedule

1st week Registration week	
2nd week:	3rd week:
Lecture:	Lecture:

Basic concepts for the handling and conveyance of materials. Classification of material handling systems. Fundamental elements of material handling systems. Properties of handled materials.

Practice:

Selection the elements of material handling systems. Basic calculations of handled materials.

4th week:

Lecture:

Continuous operating materials handling equipment II.: overhead conveyors, roller conveyors, pneumatic conveyors.

Practice:

Calculation the transport capacity of overhead conveyors, roller conveyors and pneumatic conveyors.

6th week:

Lecture:

Loader machinery. Loaders for piece-goods, powered industrial trucks and forklifts. Loaders for bulk materials, continuous operating loaders, bucket loaders.

Practice:

Calculation problems related to trucks and forklifts.

Continuous operating materials handling equipment I.: basic calculations of continuous operating materials handling equipment, belt conveyors, bucket elevators, screw conveyors.

Practice:

Calculation the transport capacity of belt conveyors, bucket elevators and screw conveyors.

5th week:

Lecture:

Hoisting machinery. Simple hoisting appliances. Crane crabs and trolleys. Overhead cranes. Gantry cranes. Jib cranes.

Practice:

Calculation problems related to cranes.

7th week:

Lecture:

Introduction to warehousing principles and technologies. Automatic storage warehouses with high racks and their equipment. Stacker cranes.

Practice:

Calculation of the parameters of warehouses.

8th week: 1st drawing week

9th week:

Lecture:

The definition of logistics. The connection between the logistics and the supply chain. Company logistics system.

Practice:

Supplying and distributing networks.

11th week:

Lecture:

Procurement logistics. Make or buy decisions. Inventory management. Economic order quantity (EOQ).

Practice:

Demand analysis. Examples for ABC and XYZ analyses. Examples for supplier evaluation. Examples for economic order quantity determination.

13th week:

Lecture:

10th week:

Lecture:

Supply chain management.

Practice:

Analysis of the supply chain of an original equipment manufacturer (OEM) and a supplier (TIER).

12th week:

Lecture:

Production logistics. Push and pull type production control.

Practice:

Examples for material requirement planning (MRP) and manufacturing resource planning (MRP II.)

14th week:

Lecture:

Distribution logistics. Distribution systems and technologies. Distribution requirements planning (DRP). Re-cycling logistics.	Packaging technology. Dangerous goods.
Practice:	**Practice:**
Examples for distribution requirements planning.	Case studies for packaging technology. Handling of dangerous goods. **2nd test.**

15th week: 2nd drawing week

Requirements

A, for a signature:

Attendance at **lectures** is recommended, but not compulsory.

Participation at **practice** is compulsory. Students must attend the practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't make up a practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, being discussed with the tutor. Students are required to bring the drawing tasks and drawing instruments to the course with them to each practice class. Active participation is evaluated by the teacher in every class. If a student's behaviour or conduct doesn't meet the requirements of active participation, the teacher may evaluate his/her participation as an absence because of the lack of active participation in class.

During the semester there are two tests: the 1st test in the 7th week and the 2nd test in the 14th week. Students have to sit for the tests.

B, for grade:

The course ends in an **examination**.

The minimum requirement of the 2 tests and the examination is respectively 50%. Based on the score of the tests separately, the grade for the tests and the examination is given according to the following table:

Score	Grade
0-49	fail (1)
50-64	pass (2)
65-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the score of any test is below 50, students can take a retake test in conformity with the EDUCATION AND EXAMINATION RULES AND REGULATIONS.

An offered grade: it may be offered for students if the average grade of the two mid-term tests is at least good (4).