

Design of Material Handling and Storage Systems

Code: MK5AMOTG04G117_EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 2nd year, 1st semester

Its prerequisite(s): Machine and Product Design

Further courses are built on it: Yes/No

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

Topics:

Designing process and steps of material handling and logistic systems. Methods for the comparison of design variants. Modelling methods of material handling systems. Representing the material handling systems as bulk service systems. Applying queueing models for the investigation of material handling systems. Designing methods of continuous operating material handling systems for bulk materials and itemised products. Analysis of the storage systems of itemised product warehouses. Required data for the planning of itemised product warehouses, the planning procedure and the main planning steps. Designing the storage space of itemised product warehouses, configuration aspects of traffic connections and product reorganization spaces. Types and design of order picking systems. Technological systems and material handling machinery of high bay warehouses. Simulation methods of material handling and storage systems.

Literature:

Compulsory:

- Gudehus, T., Kotzab, H.: Comprehensive Logistics, Springer Berlin Heidelberg, 2012. ISBN-9783642243677

Recommended:

- Mulcahy, David E.: Materials Handling Handbook; McGraw-Hill Professional, 1999. ISBN-007044014X

Schedule

1st week: Registration week

2nd week:

Lecture:

Designing process and steps of material handling and logistic systems.

Practice:

Examples of the design of material handling systems.

4th week:

Lecture:

Modelling methods of material handling systems.

Practice:

Investigation of the models of material handling systems.

6th week:

3rd week:

Lecture:

Methods for the comparison of design variants.

Practice:

Comparison of several design variants.

5th week:

Lecture:

Representing the material handling systems as bulk service systems.

Practice:

Analysis of bulk service systems.

7th week:

Lecture:

Applying queueing models for the investigation of material handling systems.

Practice:

Analysis of queueing models.

8th week: 1st drawing week**9th week:****Lecture:**

Storage systems in itemised product warehouses.

Practice:

Analysis of the storage systems of itemised product warehouses.

11th week:**Lecture:**

Designing the storage space of itemised product warehouses, configuration aspects of traffic connections and product reorganization spaces.

Practice:

Planning examples of itemised product warehouses II.

13th week:**Lecture:**

Technological systems and material handling machinery of high bay warehouses.

Practice:

Analysis of high bay warehousing systems.

15th week: 2nd drawing week**Lecture:**

Designing methods of continuous operating material handling systems for bulk materials and itemised products.

Practice:

Designing examples of material handling systems.

10th week:**Lecture:**

Required data for the planning of itemised product warehouses, the planning procedure and the main planning steps.

Practice:

Planning examples of itemised product warehouses I.

12th week:**Lecture:**

Types and design of order picking systems.

Practice:

Analysis of order picking systems.

14th week:**Lecture:**

Simulation methods of material handling and storage systems.

Practice:

Simulation analysis of material handling and storage systems.

Requirements

A, for a signature:

Attendance on the lectures is recommended, but not compulsory.

Participation at practice is compulsory. Student must attend the practices and may not miss more than three practices during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. Student can't make up a practice with another group. The attendance on practice 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, to be discussed with the tutor.

During the semester there are two tests: the mid-term test is in the 8th week and the end-term test in the 15th week. Students have to sit for the tests.

B, for grade:

The course ends in mid-semester grade based on the average grade of the two tests.

The minimum requirement for the mid-term and end-term tests is 60%. Based on the score of the tests separately, the grade for the tests 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 60, the student once can take a retake test covering the whole semester material.