

Master Seminar Management Science/Operations Research

Planning problems in modern warehouses



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Topic: This master's seminar delves into the application of Operations Research (OR) models and methods to optimize various processes in modern warehouses. Throughout the seminar, we will explore the pivotal role OR plays in order fulfillment, focusing on its practical applications and benefits. Students will gain insights into how OR methodologies can address complex problems and enhance performance in different areas, such as receiving of goods, storage assignment, order picking, or batching and sorting.

As a first step, each seminar group will be assigned a topic from the abovementioned fields. Provided with a basic optimization model, the task is to enhance the model in a way that it can be applied to even more complex problem settings. Each group is then asked to implement and solve the model with a standard solver. The developed model and the computational results will be presented in a seminar presentation as well as a seminar paper. Furthermore, each participant gets assigned an optimization model from another research paper and needs to explain the problem setting as well as the model in an individual summary paper.

Attention: Basic knowledge in Operations Research is **required**! It is **strongly recommended** that only students who have **successfully completed a basic module Operations Research and/or the master module Warehousing & Delivery Logistics** apply for the seminar. Please **do not apply** for the seminar if you do not have fundamental knowledge in mathematical optimization and modeling. To refresh your knowledge about mathematical modeling, short video tutorials will be provided before the kick-off meeting.

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Supervision: Prof. Dr. Felix Weidinger and the team of the chair

Modus and grading:

- Groups of 4 students each
- Individual summary paper (2-3 pages) must be submitted before the seminar presentations (individual work, 20% of the grade)
- Seminar presentation (20 minutes) will be held in front of all participants. Pros and Cons of the presented work will be discussed in a friendly review (group work, 40% of the grade)
- Seminar paper (20-25 pages) must be submitted by the end of the semester. Input from the friendly review after the presentation must be addressed and discussed (group work, 40% of the grade)
- All of the above tasks must be passed in order to pass the entire seminar

Language: English (for both, the presentation as well as the papers)

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Timeline:

- October 15, 2025: Kick-off presentation by the chair (presumably 11.40 am to 1.20 pm)
introduction to topic and formalities, forming of groups
- October 30, 2025: Field trip to KION in Frankfurt
- CW 43 2025 – CW 5 2026:
work on your seminar topic in groups, regular meetings with your supervisor
- January 27, 2026: Deadline for individual summary paper submission
- January 28 and 29, 2026: Seminar presentations
block seminar
- March 31, 2026: Deadline for seminar paper submission
- **All course meetings are mandatory**

Contact: Constantin Wildt, constantin.wildt@tu-darmstadt.de