KTH Industriell teknik
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LOGISTICS &
SUPPLY CHAIN MANAGEMENT

ME2053 (6 credits)

Course PM

Period 2, winter term 2023

Course description and background

Supply chain management aims to monitor and optimize flows of raw materials, semi-finished components, and finished products in complex networks of companies. Hence, the challenge of supply chain management concerns integrating and synchronizing these flows across independent companies worldwide, and ultimately ensure fast and cost-effective deliveries. Experts believe that competition is being played no longer between individual firms, but between value chains, and therefore on how well supply chain management can coordinate these firms.

This course will shed light on several logistics functions in a supply chain, i.e., demand planning and forecasting, aggregate planning, logistics, warehousing, transport, and distribution etc. Hence, providing a broad view and understanding about the peculiarities of these functions and how they should be optimally controlled and monitored. Thereafter, the course will take a strategic perspective and discuss medium-long term decisions aiming to optimize performance, coordinate supply chain companies, while ensuring sustainable and secure operations in line with the companies' social development goals.

Developing analytical tools is not one of the primary objectives of the course, yet some of these tools including forecasting techniques and linear programming, will be reviewed, and discussed with students, to strengthen understanding as well as the capacity to use these models within wider conceptual frameworks for decision making in supply chains.

Learning outcomes

After the course, the student should be able to apply basic techniques and theoretical perspectives within the area of supply chain management. Specifically, the following Learning Objectives (LO) are expected to be achieved:

- LO1. Apply mathematical models for static / adaptive demand forecasting, and inventory management for single-echelon systems.
- LO2. Apply linear programming techniques to optimize aggregate planning and network design problems.
- LO3. Describe cost-efficiency trade-offs for supply chain/distribution network design.
- LO4. Describe and apply operations strategy opportunities to reduce supply chain total costs.
- LO5. Apply scale-curve utilization in matters for supply chain design/optimal management of resources.
- LO6. Synthesize and evaluate the impacts of capacity expansion in supply chain management.
- LO7. Describe, explain, and synthesize topics related to logistics and supply chain management.
- LO8. Apply mathematical models to forecast demand, solve/optimize aggregate planning, inventory management, resources' utilization.

- LO9. Analyze a given case and create/explain an optimal/sustainable solution by applying logistics/supply chain management strategies.

Course main content

The following areas will be covered in the course:

- Inventory and Demand forecasting.
- S&OP and Aggregate Planning.
- Freight transport and logistics.
- Network structures, location problems and optimal design.
- Coordination.
- Sustainability.

Eligibility

6,0 credits (hp) in Industrial management or equivalent and a total of at least 120 credits (hp). Documented proficiency in English B or equivalent.

Examination and Grading

The course is totally 6 credits, 2+1 credits granted from four assignments to be handed in during the course (INL3 and INL4), and 3 credits from the final exam (information will be given during the course). The first three assignments are graded on a scale A to F (INL3), while the fourth (INL4), is Pass (P) or Fail (F). The final exam grading is on a scale from A to F (TEN1).

INL3 - 2,0 credits

There are three assignments to be handed in and thereby discussed in occasion of three seminars. The three assignments are mostly of quantitative nature, but qualitative discussions about the pros and cons of the techniques applied is expected.

CASES 1, 2, and 3

Students are expected to solve the cases by applying the techniques reviewed during the lectures. The assignments to be handed in will consist of the following parts:

- A **WORD** report of maximum four pages excluding references. The report must follow this structure:
    - **Question heading**
        - **Method.** Explain how proceeded to solve the assignment (max 1 page).
        - **Results and discussion.** Report the results obtained and
    - **Discussion and limitation.** Discuss pros and cons and potential implications (max 3 pages).
    - **References.** Remember to cite in text and add a list of references at the end of the report. Use Harvard style.
- An **EXCEL** file with the solution.

- A **POWER POINT** presentation to review method, results and discussion as in the report document.

Grading of the reports and presentations will be based on the following:

- **Language and structure:** The text must be well written and the text-structure following the recommendations given in this course plan.
- **Problem & solution:** The text must contain an understandable analysis of the problem and proposed solutions with explanations and reasonable arguments. The report should also include reflection on assumptions and limitations to the analysis and proposed solutions.
- **Theories application:** the text must show clearly that you are able to use the concepts and models learnt in the course to analyze the problem and the proposed solution.
- **Limitations:** the text should also show awareness and critical thinking in terms of any limitations experienced with the used concepts and models.
- **Presentation:** performance during presentation and defense of the solution to the case.

Solutions to the cases will be presented and discussed in groups in scheduled seminars (see important dates). Students will be split into groups and asked to join one of the scheduled seminars above.

Capacity of the rooms is limited; hence, students need to use CANVAS to sign up their respective groups. Additional instructions will be given during the introductory lecture. Attendance and active participation in the three seminars are mandatory.

INL4 - CASE 4

Students are expected to solve this case in groups by using the learned conceptual frameworks in the course as a starting point, but also other literature of their choice to show deeper understanding of the case and to discuss the results presented in the report. Both qualitative and quantitative analytical approaches are expected, as well as an exhaustive discussion about the pros and cons of the approach used. The solution to the case will have to be handed in a report with the following structure:

- **Methodology.** Explain how your group proceeded to solve the case.
- **Results.** Simply report here your results to the study. Remember to cross-refer to the excel file, so the teacher can verify the report with the analytical components.
- **Discussion.** Summarize your main results, giving emphasis on the potential implications for the companies studied, the contribution to existing theoretical frameworks you investigated and finally the limitations of your analysis.
- **References.** Put here the list of references you used. Use Harvard style.

CASES GRADING

Grading of the reports and presentations will be based on the following:

- **Language and structure.**
- **The problem & solution.**
- **Theories/models application.**
- **Limitations.**
- **Presentation.**

Solutions to the case will be presented and discussed in groups in scheduled seminars (see important dates). Attendance and active participation in the three seminars are mandatory. Final grade for the first 3 CASES is on a scale from A to F (and Fx). Final grade for CASE 4 is Pass (P) or Fail (F).

TEN1 – 3.0 hp grades A, B, C, D, E, F

The final score of the exam is an average of the three scores achieved for each part. The exam will be measured on a 0-100 scale accumulated by summing up the points earned from each question in the exam. To earn full points on a question is important not only to answer correctly, but to show the ability to comprehensively discuss the requested topic, hence, showing full insights, analytical skills, and logical reasoning capabilities. At the same time, the answers should clearly relate to the literature examined in the course as well as in the reports written by the students. Final grade will be decided according to the number of points accumulated at the exam, according to the following table:

EXAM POINTS	GRADE
91-100	A
81-90	B
71-80	C
61-70	D
51-60	E
45-50	Fx
0-45	F

The final grade will be approved only if all the expected 4 assignments have been handed in and passed, as well as the student has attended all the mandatory sessions in the course. In particular, the score is a weighted average of the points earned at the first three assignments (40%) and the final exam (60%).

Examination

More information given during the course or contact the teacher for details.

Course literature

- [CM] Chopra, S., & Meindl, P. (2017). Supply Chain Management: strategy, planning, and operation. Seventh edition / Global Edition, Prentice Hall.
- Other material can be included and distributed during the course, e.g., articles and documents from guest lecturers.

Students are suggested to review the relevant literature before joining the lectures.

Code of Conduct

Peer evaluations will be used to account for unequal participation in group tasks and will weigh on the participation component. In addition, any violations of the codes of conduct will be reported to KTH central admin for further investigations. Students are invited to review KTH's handbook and recommendations:

https://www.kth.se/en/student/studentliv/studentratt/fusk-och-plagiering-1.323885
https://www.kth.se/en/student/studentliv/studentratt/disciplinnamnden-och-disciplinara-atgarder-1.38425

Delivery of assignments and reports shall be punctual, with delays subject to penalties in the corresponding grades. If not well justified, final grade to be reduced by 10% for each day of lateness.

Examiner, Course responsible and lecturer:

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