

**Logistics System Implementation and Ramp-Up**

Code: 42650  
ECTS Credits: 10

Degree	Type	Year	Semester
4313489 Logistics and Supply Chain Management	OT	2	1

**Contact**

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**Use of Languages**

Principal working language: english (eng)

**External teachers**

Dr. Henning Strubelt  
Prof. Dr. Gaby Neumann  
Prof. Dr. Jens Wollenw  
Prof. Dr. Thomas Masurat

**Prerequisites**

The student has to have successfully passed the following subjects:

- Decision making (42653)
- Systems Thinking (42632)
- Generic Management Skills (42649)

**Objectives and Contextualisation**

This module has three course units: System Dynamics in Production and Logistics (Prof. Dr. Thomas Masurat/Prof. Dr. Gaby Neumann), System implementation and ramp-up (Dr. Henning Strubelt), and LSCM Project Work(Prof. Dr. Thomas Masurat, Prof. Dr. Gaby Neumann, Prof. Dr. Jens Wollenweber)

CU1: System Dynamics in Production and Logistics (5 ECTS)

After the course the student will be able to:

- understand the needs for networked/system thinking
- model, analyse, manage complex socio-economic systems
- understand chances and opportunities from scenario management
- detect, identify and evaluate identify important factors, which will have an influence on the future development of companies and business fields
- apply scenario management procedure, methods, tools for planning, managing and controlling implementation and launching of logistics systems
- make decisions in complex situations
- elaborate solid arguments to convince and motivate decision makers, select the proper partners and then plan and coordinate the project to implement the solution

## CU2: System implementation and ramp-up (2.5 ECTS)

After the course the student will be able to:

- understand challenges in implementing and launching logistics systems
- apply procedure, methods, tools for planning, managing and controlling implementation and launching of logistics systems
- address problems in logistics system implementation and ramp-up in a holistic approach
- elaborate solid arguments to convince and motivate decision makers, select the proper partners and then plan and coordinate the project to implement the solution

## CU3: LSCM Project Work (2.5 ECTS)

After the course the student will:

- Understand strategies, challenges, solutions, latest developments, ongoing research related to logistics processes and systems, their implementation and ramp-up, their management and control
- Understand specific requirements of logistics system implementation and ramp-up and their complexity
- Be able to identify and specify chances and risks in logistics systems and supply chains
- Be able to search for and report on state-of-the-art
- Be prepared for Master thesis

## Competences

- Address problems of management and coordination of logistics operations in production, transport and services in a holistic approach, by means of the consistent application of the supply chain management concepts and strategies, taking into account the pertinent aspects of environment, human capital, quality, technology, and economics.
- Apply a rigorous and efficient approach to problem solving.
- Demonstrate abilities to document and reflect the problem-solving process in order to extract the lessons learned.
- Elaborate solid arguments based on quantitative models and analytical methods in order to convince and motivate decision makers, determine the adequate LSCM partners and then plan and coordinate the project to implement the solution.
- Face a new problem under a scientific perspective.
- Identify the main aspects to be planned in the resolution of a logistic project, specifying the project boundaries, and leading with a solution
- Select and apply the most relevant analytical methodologies, strategies and current technologies for designing solutions to the problems of management and coordination of material, information and financial flows.
- Student should possess an ability to learn that enables them to continue studying in a manner which is largely self-supervised or independent
- Students should be able to integrate knowledge and face the complexity of making judgements from information which, being incomplete or limited, include reflections on the social and ethical responsibilities linked to the application of their knowledge and judgements
- Students should know how to communicate their conclusions, knowledge and final reasoning that they hold in front of specialist and non-specialist audiences clearly and unambiguously
- Work collaboratively in a group.

## Learning Outcomes

1. Address the implementation and ramp-up problems in logistic systems from a holistic approach.
2. Apply a rigorous and efficient approach to problem solving.
3. Demonstrate abilities to document and reflect the problem-solving process in order to extract the lessons learned.
4. Elaborate solid arguments to convince/motivate decision makers, select the right partners and afterwards plan and coordinate the project to implement the solution.
5. Face a new problem under a scientific perspective.

6. Identify the main aspects to be planned in the resolution of a logistic project, specifying the project boundaries, and leading with a solution
7. Select and apply the right methodologies to plan the implementation and ramp-up of logistic systems.
8. Student should possess an ability to learn that enables them to continue studying in a manner which is largely self-supervised or independent
9. Students should be able to integrate knowledge and face the complexity of making judgements from information which, being incomplete or limited, include reflections on the social and ethical responsibilities linked to the application of their knowledge and judgements
10. Students should know how to communicate their conclusions, knowledge and final reasoning that they hold in front of specialist and non-specialist audiences clearly and unambiguously
11. Work collaboratively in a group.

## Content

CU1: System Dynamics in Production and Logistics (5 ECTS)

Review of System Thinking knowledge and competence from the 1<sup>st</sup> semester

Scenario Management

- Introduction
- Scenario techniques
- Transfer of scenarios
- Overview over main approaches for strategy development

System dynamics modelling and simulation

- Introduction, terminology, motivation for complex system thinking
- Structure and behaviour of dynamic systems - feedback as a problem
- Stocks and flows
  - Causal loop diagrams
  - Stocks, flows, and accumulation
  - Dynamics of stocks and flows
- Modelling and simulation
  - Steps of the modelling process
  - Formulating a dynamic hypothesis
  - Formulating a simulation model
  - Validation and model testing
  - Policy design and evaluation

CU2: System implementation and ramp-up (2.5 ECTS)

Introduction

- Terminology
- Position of system implementation and ramp-up in the planning/production process
- Challenges in system implementation and ramp-up

Basics of ramp-up management

- Product development process
- Project management
- Simultaneous/concurrent engineering

Ramp-up strategy and organization

- Maturity models
- Logistics management in ramp-up
- Risk and uncertainty in logistics system implementation and ramp-up

Challenges in implementation and launching material handling, transport or logistics management and control systems

- time, budget, resource, staff and environmental constraints
- key players involved
- fast ramp-up

CU3: LSCM Project Work (2.5 ECTS)

Specification, analysis, description, classification, evaluation of strategies, current and future challenges, technical, managerial or methodological solutions, latest developments, ongoing research related to logistics processes and systems, their implementation and ramp-up, their management and control

Identification of chances and risks

## Methodology

Teaching will be offered on campus or in an on-campus and remote hybrid format depending on the number of students per group and the size of the rooms at maximum capacity allowed by local rules at any time of the semester.

CU1: System Dynamics in Production and Logistics (5 ECTS)

The course is organized by means of traditional lectures combined with seminars and practical work. The learning process will combine the following activities:

- Classroom sessions: theory lectures. They aim to understand method, procedure, effects of dynamics in complex systems, and the role of scenario management to cope with them.
- Exercise sessions: classroom discussions. Aims to apply methods and techniques for system dynamics modelling and scenario building and evaluation
- Lab sessions: introduction to software, experimentation. Aims to get familiar with new software tools (Vensim); practice model building and simulation-based analysis of dynamic socio-economic systems
- Business game: group work, experimentation. Aims to apply elements of scenario management on a complex situation within an experimental setting, test different strategies within a supply chain simulation (The Fresh Connection)
- Project work: group work, experimentation. Aims to apply system dynamics thinking and approach; practice model-building and experimentation; demonstrate ability to systematically derive conclusions from handling complex socio-economic systems
- Autonomous work: reading, self-testing, reflecting. Retrieve and analyse information from different sources; reflect learning and problem solving processes in order to derive lessons learned.

Exercise/lab sessions, business game and project work are used for promoting students' hands-on skills.

CU2: System implementation and ramp-up(2.5 ECTS)

The course is organized by means of traditional lectures combined with seminars and practical work. The learning process will combine the following activities:

- Classroom sessions: theory lectures. Aims to understand challenges in implementing and launching logistics systems; name and explain procedure, methods, tools for planning, managing and controlling implementation and ramp-up of logistics systems.
- Exercise sessions: classroom discussions. Aims to select and apply suitable methodologies and strategies to plan logistics system implementation and ramp-up.
- Case study: include group work, business game. Aims to apply simulation methodology to plan and test ramp-up strategies; run and manage logistics system implementation and ramp-up projects in a market setting.

Autonomous work: reading, self-testing, reflecting. Retrieve and analyse information from different sources; reflect learning and problem solving processes in order to derive lessons learned.

### CU3: LSCM Project Work (2.5 ECTS)

The course is organized in the form of a scientific workshop. Each student works independently on an individual topic searching for relevant literature (textbooks, technical journals), implementation and application reports (technical journals, websites), technical details of logistics equipment/systems (fact sheets, supplier brochures/websites). An individual mentor gives support and provides guidance in topic specification, identification of research questions, literature review and paper design. The topic can either be chosen from a given list or proposed by the student. Each student has to submit his/her topic together with a 200 words abstract to all mentors. Mentors decide about acceptance/rejection of the topic and who is going to supervise. Students prepare a scientific paper to be submitted for presentation at the workshop. The paper will be marked by the mentor; presentations/discussions will be marked by the group of mentors and by the students (peer review). Best papers are compiled within workshop proceedings for publication on the LSCM website.

The learning process will combine the following activities:

- Seminar/consultation: include classroom discussion, student presentation, coaching. Aims to identify and specify topics of relevance in logistics and supply chain management, e.g. for process and systems, their implementation and ramp-up, their management and control; present approach, structure, state-of-work; ask questions.
- Workshop: Scientific paper, student presentation. Aims to clarify topic, research questions and expected outcomes in the form of an abstract to be submitted to a scientific workshop; write a scientific workshop paper; present project results in the workshop and discuss with workshop participants.
- Project work: Literature search and review, project reporting in a scientific paper, student presentation in a scientific workshop. Aims to provide state-of-research with regard to analysis, description, classification, evaluation of strategies, challenges, methods and solutions, approaches for implementation and ramp-up, management and control; discussion about potential/risks in contributing to future development of logistics and Supply Chain Management; presentation of approach and findings in a structured way in writing and orally; experiencing formal procedure of a scientific workshop.
- Autonomous work: reading, self-testing, reflecting. Retrieve and analyse information from different sources; reflect learning and problem solving processes in order to derive lessons learned.

The proposed teaching methodology may undergo some modifications according to the restrictions imposed by the health authorities on on-campus courses.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
CU1. Exercises	10	0.4	1, 3, 4, 9, 8, 5, 2
CU1. Lab sessions	20	0.8	1, 3, 10, 7, 5, 2
CU1.Theory lectures	30	1.2	1, 6, 9, 8
CU2. Exercises	15	0.6	1, 3, 4, 9, 8, 7, 2
CU2. Theory lectures	12	0.48	1, 4, 7
CU3. Seminar	22	0.88	1, 7
CU3. Wokshop	7	0.28	1, 3, 6, 9, 10, 7
Type: Supervised			

CU1. Business Games	30	1.2	3, 4, 9, 10, 7, 5, 2, 11
CU1. Project work	30	1.2	3, 4, 6, 9, 10, 5, 2, 11
CU2. Case Study	18	0.72	3, 6, 10, 7, 5, 2, 11
CU3. Project work	30	1.2	1, 3, 4, 9, 10, 7
Type: Autonomous			
CU1. Self-learning	8	0.32	1, 4, 8, 7, 5
CU2. Self-learning	8	0.32	1, 4, 8, 7
CU3. Self-learning	5	0.2	1, 4, 8, 7, 5

## Assessment

### CU1: System Dynamics in Production and Logistics (5 ECTS)

The final mark of this course will be calculated from the assessment of following evaluation activities:

- Case study. Student teams play six rounds of The Fresh Connection business game recording their situation analysis, intended changes, decisions made, and outcomes achieved in a logbook according to a given structure. The logbook and the final result achieved in the business game are graded.
- Project work. Student teams analyse and model The Fresh Connection company as a complex socio-economic system for a given scenario and run simulation-based evaluation of system behaviour, control levers and risk factors. Simulation experiments are documented in a simulation logbook. Model building, experimentation, results and conclusions are presented and graded.
- Final exam. Each student individually undergoes an oral exam addressing theoretical and methodological questions in the context of the semester.

### CU2: System implementation and ramp-up (2.5 ECTS)

The final mark of this course will be calculated from the assessment of following evaluation activities:

- Mid-term exam. Theoretical questions on topics addressed throughout the semester in order to present generic understanding on system implementation and ramp-up in correspondence to learning objectives.
- Case study: Practical assessment of project work and problem-solving expertise based on lecturer and peer assessment.

### CU3: LSCM Project Work (2.5 ECTS)

The final mark of this course will be calculated from the assessment of following evaluation activity:

- Project work. The topic can either be chosen from a given list or proposed by the student. Each student has to submit his/her topic together with a 200 words abstract to all mentors. Mentors decide about acceptance/rejection of the topic and who is going to supervise. Student reports (scientific papers) will be marked by the mentor; presentations/discussions will be marked by the group of mentors and by the students (peer assessment).

### CU1, CU2 and CU3

The mid-term exam (CU2) is comprised of theoretical questions and small cases on topics addressed throughout the semester in order to present generic understanding on system implementation and ramp-up in correspondence to learning objectives.

The student passes the module if case studies, projects and the mid-term exam are evaluated "sufficient" (grade 4.0 corresponding to a minimum of 50% of the maximum performance per evaluation activity) at least. The student fails if performance in at least one of the evaluation activities does not reach the 50% threshold or if the case study reports/presentations or scientific paper are not submitted within the due date specified by the professor.

In case of fail the student needs to retake just that part of module exam s/he failed. The decision about this is in hands of the examiner. If any case study is failed, the student will either be provided with a new case study or asked to re-submit its report according to the corrections/indications provided by the professor. The same applies to project work resulting in a scientific paper.

Students who fail the mid-term exam may be permitted the opportunity to retake this examination twice at a maximum. After that his/her right for examination terminates. Retaking an exam is allowed only in case the student previously failed, but not to improve grades achieved so far.

Examination dates are announced in due time, but at least two weeks prior to the respective exam. Submission deadlines for case studies, project report, scientific paper and any presentation activities related to them are announced when giving case studies or project work to students. Specific examination dates are published on the university's website.

The weights of each evaluation activity are given in the table below.

The proposed evaluation activities may undergo some changes according to the restrictions imposed by the health authorities on on-campus courses.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
CU1. Case study	6.25%	1	0.04	1, 4, 9, 10, 8, 7, 2, 11
CU1. Final Exam	12.5%	2	0.08	1, 4, 9, 7, 2
CU1. Project work	31.25%	0	0	1, 3, 4, 6, 9, 10, 8, 7, 2, 11
CU2. Mid-term exam	12.5%	2	0.08	1, 9, 7
CU2. Practical assignment	12.5%	0	0	1, 3, 4, 9, 10, 7, 2, 11
CU3. Project work	25%	0	0	1, 3, 4, 10, 8, 5

## Bibliography

To be provided during the lecturing period.

## Software

Vensim (System Dynamics simulation software)

The Fresh Connection (web-based Supply Chain Management business game)