



## **Supply Chain Dynamics (SCD)**

Summer term 2016, version: 24/04/2016

### Technicalities

One semester course, taught every second semester in the summer term.

Six credit points, four hours course per week. Taught in English.

Course coordinator and lecturer: Prof Dr Andreas Größler

Part of the MSc study programme in technically oriented business administration.

### Time and location

Classes: Mondays, 15:45–17:15 in KII M 17.52 and Thursdays, 17:30–19:00 in KI M 11.32

First class: Monday, 4 April, 15:45, then every week on Monday and Thursday until term ends (details see time table)

### Requirements

Introductory bachelor level courses in operations management and/or logistics

### Short description and learning goals

The course starts with discussing the nature of supply chains, in particular their dynamic aspects. Students acquire first-hand experience on effects of dynamic behaviour. A major part of the course is devoted to learning a methodology for better understanding and controlling supply chain, system dynamics. It is used to analyse some real world cases of dynamic supply chain issues.

After successfully finishing the course, students can:

- name and discuss sources and effects of dynamics in supply chains
- analyse simple supply chain structures with the help of dynamic models
- understand and evaluate complex dynamic supply chain models

### Course design

Although officially split into lectures and tutorial sessions, all classes consist of theoretical and practical parts. Thus, the content will run over the two sessions per week with teacher presentations, case study work, modelling exercises, and experiential learning elements. Assessment will most likely be carried out by means of a written exam.

Course element	Quantity	Time required	Total [h]
Contact hours			
Interactive lectures	26	2 h	52
Self-study			
Reading assignments	429 pp.	90.5 h	90.5
Preparation of case studies	8	2 h	16
Exam preparation	1	20 h	20
			<i>126.5</i>
Examination			
Written exam	1	1.5 h	1.5
<b>Total</b>			<b>180</b>

### Time table

Week	Date	Topic	(Reading) assignment
14	C1 Mon, 04/04	Introduction to and motivation for course	Akkermans, ch. 1
	C2 Thu, 07/04	Experience dynamics: The Beer Game	
15	C3 Mon, 11/04	Beer Game debriefing	Senge, ch. 3
	C4 Thu, 14/04	Dynamic decision making and its shortcomings	Akkermans, ch. 3
16	C5 Mon, 18/04	An introduction to system dynamics	Akkermans, ch. 2
	C6 Thu, 21/04	Experience your biases (work outside class)	Fill out bias assignment
17	C7 Mon, 25/04	Hands on session: getting to know Vensim	Sterman, ch. 3
	C8 Thu, 28/04	Practice session: short modelling exercise	Vensim tutorial
18	C9 Mon, 02/05	Business cycles and oscillations	Akkermans, ch. 4

19	C10	Mon, 09/05	Modelling the first Philipps case	Prepare model
	C11	Thu, 12/05	Information sharing along the supply chain	Akkermans, ch. 5
20	No class: Pentecost holidays			
21	C12	Mon, 23/05	Modelling the ASML case	Prepare model
22	C13	Mon, 30/05	Growth dynamics	Akkermans, ch. 6
	C14	Thu, 02/06	Modelling the Interpolis case	Prepare model
23	C15	Mon, 06/06	New product development projects	Akkermans, ch. 7
	C16	Thu, 09/06	Modelling the TechCo case	Prepare model
24	C17	Mon, 13/06	Managerial decision biases	Akkermans, ch. 8
	C18	Thu, 16/06	Modelling the Airbus case	Prepare model
25	C19	Mon, 20/06	Video lecture by John Gattorna: <a href="https://www.youtube.com/watch?v=1izE5zshhrY">https://www.youtube.com/watch?v=1izE5zshhrY</a> (watch outside class)	
	C20	Thu, 23/06	Capacity building and quality issues	Akkermans, ch. 9
26	C21	Mon, 27/06	Modelling the KPN case	Prepare model
	C22	Thu, 30/06	Buyer-supplier relationships	Akkermans, ch. 10
27	C23	Mon, 04/07	Modelling the second Philipps case	Prepare model
	C24	Thu, 07/07	Implementation issues	Akkermans, ch. 11
28	C25	Mon, 11/07	Collaboration and outsourcing	Akkermans, ch. 12
	C26	Thu, 14/07	Course summary and Q&A	Akkermans, ch. 13

## Structure

Classes C1–C8 set the scene by making clear that dynamic complexity is tricky to understand for humans. Modelling and simulation is advocated as a way to better deal with dynamic issues in supply chain management. This part also addresses the basics of Vensim and makes use of an experiential learning exercise (the Beer Game).

Classes C9–C25 deal with specific topics of supply chain dynamics. General information about the issues is provided; then, a specific case is modelled with system dynamics and analysed regarding its general insights.

C26 concludes the course with a summary.

## References to readings

Akkermans, H.: Supply Chain Dynamics – Mastering Disruptive Change in Innovation-Driven Industries, 2014, Uitgeversgroep [ISBN 978-94-002-1608-2], pp. 1–378.

Senge, P.M.: The Fifth Discipline – The Art and Practice of the Learning Organization, 1990, Currency Doubleday, pp. 27–54.

Sterman, J.D.: Business Dynamics – System Thinking and Modeling for a Complex World, 2000, Irwin McGraw-Hill, pp. 83–105.

## Software

Download and install Vensim PLE on your computer: <http://vensim.com/free-download/>.

A tutorial for Vensim PLE by Craig Kirkwood is available at <http://www.public.asu.edu/~kirkwood/sysdyn/SDRes.htm>.