



Supply Chain Analytics II: Prescriptive Analytics

For information on how to access the online sessions and further course material, see ILIAS.

Course Description

Increasing complexity of global supply chains on the one hand and increasing availability of data and processing power on the other hand lead to growing opportunities in the field of data analytics. Supply Chain Analytics II focuses on forward looking issues, that may be clustered in two parts: The first part tackles uncertainty in supply chain processes, and how to evaluate them by means of Monte Carlo Analysis. The second part looks at how to derive recommendations using optimization methods.

The course consists of recorded video lectures, case discussions, and a project. In the project, the concepts that are covered in the lectures are applied to a data set. It prepares students to identify improvement opportunities that exist in actual supply chains, to quantify possible improvements, and to control supply chain performance.

Course Administration

Class times Monday, 14.00-15.30 Hauptgebäude Hörsaal XVIII
Monday, 16.00-17.30 Hauptgebäude Hörsaal XVIII
Wednesday, 14.00-15:30 Hauptgebäude Hörsaal XVIII

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Assignments There are regular homework assignments. Students can earn bonus points by uploading complete solutions to Ilias on time and by presenting them in class. In addition, students have to work on a project assignment and upload their solution to Ilias. The project will be graded.

Grading Project 40%, exam 60%
Additionally, there will be 6 bonus points.

Exam 23rd February 2022

Project Deadline 13th February 2022 10am



Language

The lectures and discussion sessions are taught in English.

Prerequisites

Basic knowledge in statistics and Python. The necessary knowledge about Python can, e.g., be acquired in the free online course Python Basics for Data Science. Successful participation in Supply Chain Analytics I: Predictive Analytics is strongly recommended.

Course Overview

1. Plenum

The plenum sessions will take place on Mondays. During these sessions, students will present their solutions and we will discuss them. Each session will last up to 90 minutes.

2. Self-learning phases

During the self-learning phases, you should read and understand the material in Ilias (videos, slides, practice questions). If you want to better understand the mathematical background of some of the concepts we refer to literature in the lectures. Students prepare the project in a group. We further encourage students to discuss the case studies with each other. The students are responsible for their time management.

The course will be split into two groups. One group will have the plenum session on Mondays at 2pm, and one group will have the plenum session on Monday at 4pm. You can register for one of the groups on Ilias. Please only attend the class at the time you signed up for. The Wednesday sessions will be for the entire class. Please take a look at the course schedule for details.

Submissions

1. Assignments

To earn bonus points you have to upload your complete solutions before the plenum takes place on Ilias. By uploading your solutions you agree to presenting your solutions in the plenum. You can only receive the bonus point if you actively take part in the plenum session. For each submission you can get one bonus point. Please use the Jupyter Notebooks that are provided in Ilias and add your code.

2. Project

During the semester you will work on a project. You can find the data set and a jupyter Notebook including a detailed description of your task in Ilias. You should work on the project in groups of up to four members.



Course Agenda

	Monday	Tuesday	Wednesday	Thursday	Friday
	05	06	07	08	09
December	Plenum: Welcome Self-learning: Understanding Uncertainty		Python Tutorial		
	12	13	14	15	16
	Plenum: Understanding Uncertainty Self-learning: Monte-Carlo Simulation		Simulation Tutorial		
	19	20	21	22	23
	Plenum: Monte Carlo Simulation Self-learning: Linear Optimisation		Gurobi Q & A		
	26	27	28	29	30
	<i>Christmas Vacation</i>		<i>Christmas Vacation</i>		
January	02	03	04	05	06
	<i>Christmas Vacation</i>		<i>Christmas Vacation</i>		
	09	10	11	12	13
	Plenum: Linear Optimisation Self-learning: Mixed Integer Optimisation		Modelling tutorial		
	16	17	18	19	20
	Plenum: (Mixed) linear Integer Optimisation Self-learning: Logical Operators in Modelling		Guest Lecture Camelot		
	23	24	25	26	27
	Plenum: Logical Operators in Modelling Self-learning: Stochastic Optimisation		Project Q & A		



	30	31	01	02	03
	Plenum: Stochastic Optimisation		Summary/ Q & A		