

# MSc Supply Chain Analytics Programme

## 1. Profile of the programme

Are you business-minded and inspired by smart solutions and opportunities? Do you have a practical yet analytical way of thinking about redesigning sustainable supply chains from the perspective of information technology, business economics and operations optimization? Are you eager to learn more about using data-intensive analysis approaches in life sciences? Then this programme is designed for you! You will learn the skills and in-depth knowledge to bridge the gap between scientific theory and its applicability in supply chains. You will learn to deal with the complexity of modern decision making in sustainable supply chains to be able to translate promising approaches to specialists like software developers, econometrists, or applied mathematicians. As a graduate, you will be a valuable, academically trained generalist who understands supply chain processes, envisions how new developments can be applied in supply chains to make an impact, and has learned how complex decision problems should and can be solved in practice.

## 2. Unique selling points

- The programme meets the demand for multidisciplinary graduates with a comprehensive view on the increasing complexity and specific challenges of supply chains in the domain of life sciences.
- As a graduate you can bridge the gap between theory and its applicability in real-life enterprises.
- The programme provides you a toolkit of measurable and generically applicable methods and techniques for decision-support in sustainable supply chains.
- The programme exploits and strengthens structured analytical thinking of you as a graduate.
- The programme is unique by combining three dominant perspectives in supply chains, i.e. information technology, business economics and operations optimization in supply chains.

## 3. WU-BSc-programmes with unconditional admission

Students from the WUR BSc programme BBC have unconditional admission to this MSc programme.

## 4. Main target groups next to unconditionally admitted students

- Students with a WUR-BSc degree in the BEB programme or a technical life sciences programme, such as plant sciences, environmental sciences, food technology, biosystems engineering, and animal sciences, and sufficient basic knowledge in operations research, business economics, and information technology.
- Students from other universities with a BSc degree in the broad domain of supply chain management (e.g., business studies, life science and management, finance).
- Graduates from applied universities (HBO) with a program in the domain of agricultural and food sciences, business studies/administration, or supply chain management and who have taken sufficient relevant courses in disciplines as operations research, business economics and information technology, either as part of their HBO program (e.g. by including a WUR BSc minor) or by following a relevant premaster.

## 5. Admission requirements for students not unconditionally admissible

- a. At least 30 credits of courses during the BSc in the disciplines Supply chain Management, Operations Research, Operations Management, Business Economics, Information Technology, Accounting, Financial Management, and/or Logistics
- b. At least 12 credits in Mathematics and 6 credits in Statistics in the previous BSc study.
- c. A GPA for the BSc study programme of at least 70% of the maximum scale.
- d. Fluency in English, both written and spoken.

## 6. Information on the 30 credits specialization courses

The programme starts with three in-depth courses on theories and concepts of the three main perspectives in supply chain analytics, i.e., information technology, business economics and operations optimization. The acquired knowledge from these courses is subsequently applied in the integration course *Sustainable Supply Chain Analytics* by working on a complex case study from practice. The final thesis preparation course focusses on core research competences and skills to prepare students for their research project (thesis).

### 1. Business information analytics (6 ECTS, new course, compulsory)

This course focuses on business information systems and data analytics. Managers and decision-makers need up-to-date business intelligence, visualized in dashboards, to be able to respond adequately to potential problems, to plan and strategize, and to capture new marketing opportunities. Business information systems focuses on how to design and facilitate information exchange within business processes, both in the organization and between supply chain partners. Data analytics explores the potential of (big) data, including machine learning approaches, to acquire useful insights. The course further addresses selected topics related to programming and software engineering, systems modelling, technological enablers, Artificial Intelligence, and visualization techniques.

### 2. Economic decision making under risk (6 ECTS, new course, compulsory)

Economic actors in supply chains in the agri-food sector have to make decisions in the context of an environment that is characterized by a variety of risks such as production risks, price and market risks, financial risks, and policy risks. Managing these risks is key for a resilient and sustainable supply chain. This course provides students with the theories (e.g. expected utility theory, behavioural decision theory, investment theory, resilience theory), concepts (e.g. value of information/big data) and analytical methods (e.g. econometric modelling, stochastic simulation) that enable them to analyze economic decisions under risk.

### 3. Material flow analytics for sustainable supply chains (6 ECTS, new course, compulsory)

Adequate management and optimization of the operations in the chain of supplies from source to sink requires a deep understanding of network design, production planning, inventory control and transportation management. Many problems in practice are so big and often rely on so much data that they are too difficult to solve with straightforward, off-the-shelf tools. Alternative concepts, approximation methods and visualization techniques are presented to explore and find effective solutions for managing the flow of goods from source to sink. This provides an indispensable foundation for successful interpretation and application of generated solutions and provides the tools for core decision problems in nowadays' supply chains.

### 4. Sustainable supply chain analytics (6 ECTS, based on existing course, compulsory)

This course is based on the concept of the current course "Advanced Supply Chain Management" (YSS32806) and integrates the acquired knowledge and skills from the three core specialization courses. The course provides a

multi-disciplinary basis for the analysis and improvements along the three main perspectives in supply chains (information technology, business economics, and operations optimization). A substantial part of the course includes an integrated case that will be analyzed taking the three main perspectives in this programme into account. Professional skills, such as interdisciplinary and intercultural cooperation, communication, and presentation skills, will be acquired while working on the integrated case.

**5. Thesis preparation course (2\*3 ECTS, new course, compulsory)**

The course aims to teach core research competences needed to prepare for the thesis within this programme and consists of two modules of 3 ECTS each. In the first module, students learn to think critically (philosophically) about the truth claims of scientific knowledge, especially with respect to the combination of scientific theory and design-oriented research, and related ethical issues to provide a basis for responsible research behaviour. In the second module, the focus will be on the specific research competences and skills as required in each of the three perspectives constituting this programme, i.e. information technology, business economics and operations optimization in supply chain networks.

**7. Chair groups that offer a major thesis in this programme**

Business Economics (BEC), Information Technology (INF) or Operations Research and Logistics (ORL).