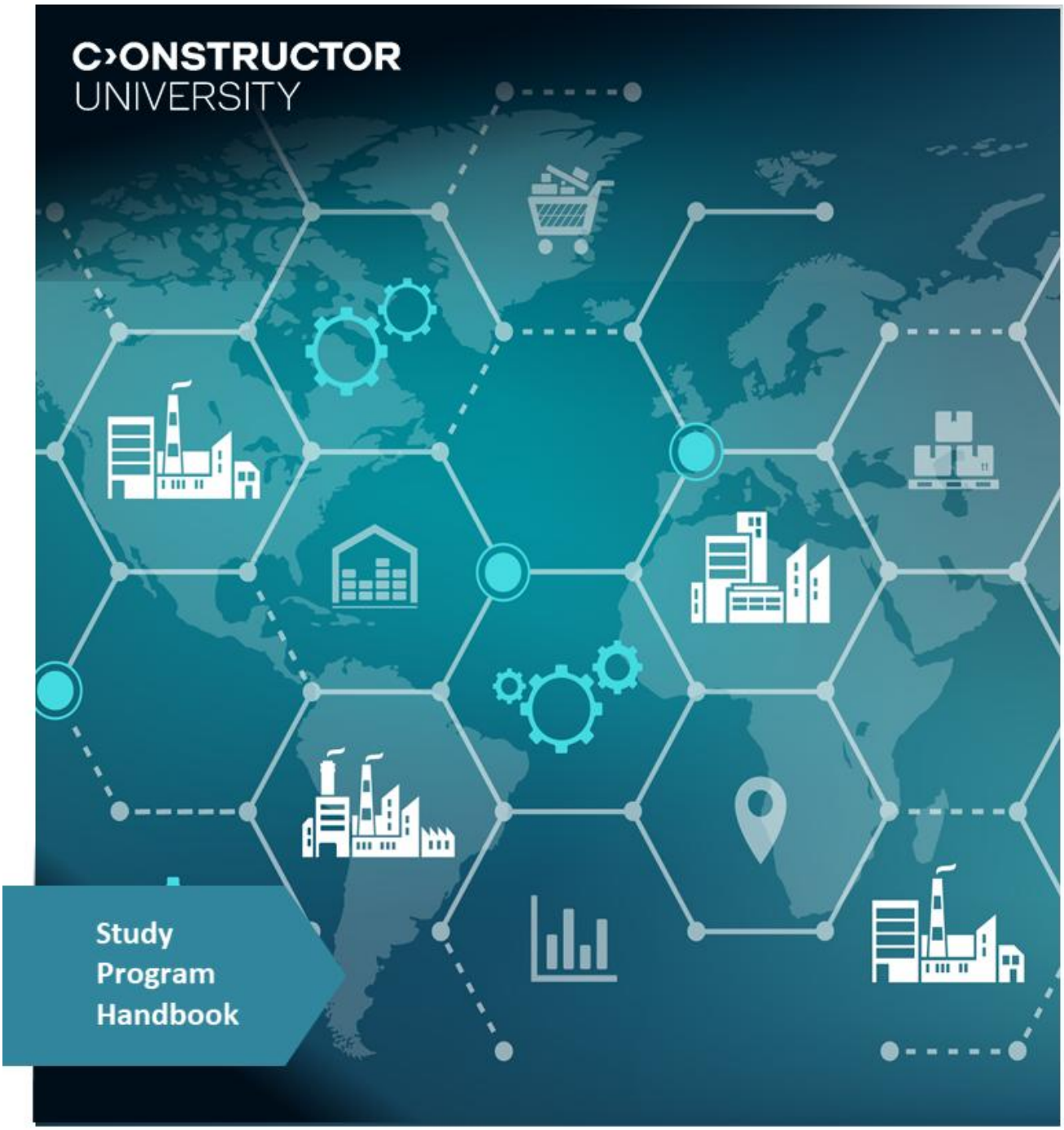

Supply Chain Management

Master of Science

Subject-specific Examination Regulations for Supply Chain Management (SCM)

The subject-specific examination regulations for SCM are defined by this program handbook and are valid only in combination with the General Examination Regulations for Master degree programs ("General Master Policies").

Upon graduation students in this program will receive a Master of Science (MSc) degree with a scope of 120 ECTS credit points (CP) (for specifics see chapter 3 of this handbook).

Valid for all students starting their studies in Fall 2026

Version	Valid as of	Decision	Details
Fall 2026 – V1.2	Sep 01, 2026		Change of status of Research project from mandatory elective (me) to mandatory (m)
Fall 2026 – V1	Sep 01, 2026	May 22, 2019	Originally approved by Academic Senate

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1 Program Overview

1.1 Background

The worldwide exchange of goods, the mobility of people, and the constant flow of information and ideas require expertise about transport chains, exchange processes, and the available design options, as well as an ability to develop new methods in order to meet future challenges in an increasingly digitalized world. The primary goal of supply chain management (SCM) is to constantly enhance competitive advantages and to optimize the entire chain organization from strategy to implementation.

Supply chain management has grown from an important instrument of operative optimization into a distinguishing strategic feature in competition. Supply chain management is key to the performance of highly successful enterprises. It adds value for both the company and its clients. Companies' supply chains must be constantly developed, reconfigured, and optimized in order for firms to adapt to changing supply chain environments. This requires the consideration and interpretation of a large number of technological, product, process, geographical, and structural data and conditions; firms must also derive situation-specific responses and anticipate future developments. This requirement calls for well-trained leaders with the ability to accurately position supply chain management as a strategic business function.

These leaders must take on these challenges with a strong desire and ability to master them. Executives and project leaders require suitable methods with which to both handle the increasing complexity of the business environment and reduce it. Therefore, they need a concrete understanding of the interdependencies between supply chain elements and the growing amount of data exchanged between them. This is a prerequisite for a proper understanding of supply chains via data analytics and the application of methods and tools for optimizing cross-company coordination, processes, and communication.

1.2 Concept

It is to be expected that the demand for leaders capable of dealing with challenges related to highly interconnected and digitalized supply chains will increase. Constructor University's Supply Chain Management (SCM) program aims to satisfy this demand through a holistic educational approach focusing on interdisciplinary and practical knowledge that prepares its students for the complex challenges facing both industry and logistics research. It does so by encompassing the abovementioned core challenges in different ways and appropriately roots them in various curriculum modules.

The unique selling proposition of this program is its strong focus on data analytics and data engineering. In an increasingly interconnected and digitalized world, a vast amount of data is gathered along supply chains that need to be processed, analyzed, and made accessible to decision-makers. Specially tailored modules in data analytics and programming equip our students with the required skills, which are in high demand across industries.

With participating students from different disciplines and various prestigious universities from around the world, the program aligns students´ knowledge base regarding SCM in the first semester and builds on this with specialist modules in the next semester. In the third semester, independent research and

application become more prominent, leading to the preparation of a master´s thesis on a challenging topic.

The program is application-oriented. The modules are aligned with real-world issues, involve practitioners from successful companies in various industries, collaborate with companies to conduct case studies, and include field trips. The program's content focuses on companies´ current needs and takes into account external company structures. It explores supplier relationships as well as the management of relevant company networks.

The program's educational approach is characterized by its strong practical relevance and high participant involvement. Lecturers enthusiastically apply the latest instruction techniques and interactive teaching strategies. Students are introduced to models, instruments, and methods that can be transferred to all fields related to logistics, supply chain management, and production. Lecturers help students apply theoretical knowledge through practice with exercises, case studies, simulations, and business games. Moreover, critical discussions are encouraged in order to inspire and improve students' understanding of module contents.

Apart from professional qualifications, the development of social competence is necessary for a successful career in the field of SCM. Therefore, the program emphasizes the participants' personal development in terms of soft skills and language skills. Given the diversity in the student body and their tendency to work in Germany, we train students in German language proficiency and convey country-specific information to prepare them for the national and international job markets.

The study program chair believes in the value of experience-based learning. Hence, faculty, lecturers, and tutors intensively use case studies, business games, and simulations as active teaching methods. Furthermore, students learn and work successfully in interdisciplinary and intercultural teams.

Intensive communication and discussion between lecturers and participants are central elements of the program. The personal support provided to each student by an assigned Academic Advisor as well as regular meetings with the program chair ensure the successful completion of the program despite students' differing learning rates and entry knowledge levels.

The successful completion of the program leads to the conferral of an internationally acknowledged Master of Science (MSc) degree and enables a quick career entry in the area of supply chain management, either in a national or an international context.

1.3 Qualification Aims

1.3.1 Educational Aims

Firms need skilled employees in order to become trend- and agenda-setters in the latest production and logistics technologies, control and optimization approaches, and customer- and employee-oriented management.

The SCM program aims to provide an in-depth understanding of the essential aspects of designing, maintaining, and analyzing supply chains as well as to teach the skills necessary to apply methods and tools to successfully and responsibly work on/in supply chain networks. The program seeks to expand the participants' competencies and capabilities in order to prepare them for all upcoming tasks and developments within increasingly digitalized supply chains.

The curriculum aims to teach modern leadership and management competencies with a strong emphasis on data analytics and engineering. This includes the analysis of data-driven business processes, the ability and readiness to recognize the potential for change, the initiation of change processes, and their successful design.

Students are introduced to working with and within companies and experience rapid professional development through frequent individual feedback sessions and personal guidance. This facilitates and quickens their career development and helps them to become valuable assets in the workforce within a short period of time.

Constructor University programs are offered in a highly intercultural environment. Students acquire intercultural competence as part of their education through everyday group work, class participation, and extracurricular activities. In this way, students gain practical intercultural competencies and build their confidence in an English-speaking work and study environment. Presenting a strong, confident appearance and communicating effectively in various cultural contexts are among the core abilities of internationally successful executives in any business area.

1.3.2 Intended Learning Outcomes

By the end of this program, students will be able to:

1. critically evaluate and apply the most important theories and methods of supply chain management, supplier relations, and value creation to real-world situations, organizations, and industries;
2. integrate new knowledge in complex supply chain contexts based on extensive data analytics;
3. assess opportunities and risks in global supply networks;
4. make scientifically substantiated and data-driven decisions in the context of SCM and logistics and critically reflect the possible impacts on business, the environment, and society;
5. independently investigate complex problems and develop new knowledge using both qualitative and quantitative methods;
6. apply interdisciplinary approaches (especially from data science and engineering as well as mathematics) to solve academic and professional problems;
7. efficiently and effectively manage supply chain-related projects in multicultural and diverse environments;
8. detect potential conflicts and solve interpersonal issues in large projects;
9. communicate clearly and professionally with experts from different disciplines in a variety of forms and moderate interdisciplinary interactions;
10. manage multicultural and diverse environments and effectively participate in and lead mixed teams;
11. use individual feedback continually to develop and mature within their studies and beyond;
12. quickly become acquainted with their work and thus begin their career more easily because of the integration of theory and practice during their education;
13. develop a professional self-perception based on goals and standards of professional actions in SCM;
14. justify their professional actions with methodical knowledge and develop alternative approaches to supply chain management issues;

15. take responsibility for their own learning, personal development, and social roles;
16. adhere to and defend ethical, scientific, and professional standards.

1.4 Target Audience

The program is designed for students of different professional, geographical, and cultural backgrounds. Candidates who are dedicated to and interested in gaining theoretical and application-oriented knowledge are particularly addressed by the program.

Prior to admission, applicants have already completed their first degree or equivalent training in the discipline of logistics, economics, engineering, or information technology. Applicants with first degrees in other subject areas who have a proven special affinity or strong interest in the topic and a desire for further master-level practical education are also welcome to apply.

The program addresses young professionals with a few years of work experience who would like to focus or deepen their knowledge in the field of SCM and who are interested in an application-oriented course of study. The program prepares students for a career in industry. Most graduates enter the job market after completing the program. Non-Germans interested in starting a career in Germany or at a German enterprise will gain the insights and preparation necessary to enter the German labor market.

The program's educational approach supports exchange and discussion within the student community. Hence, the willingness to interact, to appreciate different teaching and learning formats, to accept challenges, and to develop professionally during the course of study are important requirements for successful participation in the program.

1.5 Career Options

Supply chain management combined with data analytics is a growing profession in high demand worldwide.

The program prepares its participants to become decision-makers in an increasingly interconnected world: Graduates will become true managers of the digitalized economy. SCM opens the door to a wide range of careers in Germany, Europe, and around the globe. The data analytics- and engineering-oriented profiles of the MSc Supply Chain Management graduates are of great interest to companies operating in national and international contexts; medium and large sectors; and trade, service, and production industries. Graduates are particularly qualified for tasks in the fields of supply chain management, logistics, procurement, retail, process optimization, and beyond.

The career paths open to SCM graduates are manifold. They range from specialists in supply chain fields to project management careers in different fields, and from operational to strategic and corporate management positions. After graduation, students will be able to fulfil various project responsibilities by applying the knowledge gained in the areas of supply chain management, logistics systems, project management, leadership, and team management.

Program graduates have found employment at renowned international companies with ease. Those continuing to PhD studies have been accepted to top-ranked universities. According to our alumni surveys, most program graduates start their careers in Germany, usually in the manufacturing industry. Others work in The Netherlands, Denmark, the United States, Switzerland, India, the United Kingdom, Singapore, Belgium, Thailand, China, and elsewhere. Graduates work in diverse industries, such as the

automotive, aerospace, consulting, manufacturing, transportation, railway, food and beverage, retail, purchasing, wholesale, and information technology sectors, as well as NGOs.

The Career Service Center (CSC) helps students in their career development. It provides students with high-quality training and coaching in CV creation, cover letter formulation, interview preparation, effective presenting, business etiquette, and employer research as well as in many other aspects, thus helping students identify and follow up on rewarding careers after graduating from Constructor University. For further information, please contact the Career Service Center (CSC) (https://constructor.university/student-life/career-services). Furthermore, the Alumni Office helps students establish a long-lasting and global network which is useful when exploring job options in academia, industry, and elsewhere.

1.6 Admission Requirements

The Supply Chain Management graduate program requires students to hold at least a good bachelor's degree in the areas of business administration, logistics, economics, industrial engineering, and management, or in information technology. Applicants need to prove a strong interest in the contents of the study program in a motivation letter. The general "Admission and Enrollment Policies" of Constructor University apply (see Academic policies | Constructor University). Social commitment as well as extracurricular and voluntary activities during undergraduate studies, e.g., university service, clubs, varsity, social work, etc. will be considered. Work experience (one to three years) is recommended, but is not a prerequisite.

Additionally, participants should possess elevated analytical, problem-solving and verbal communication skills which must be substantiated in recommendation letters.

Study at Constructor University takes place in a highly intercultural environment. It is therefore necessary to be willing to join such a multicultural-international community and work together with students and faculty across various fields of interest at Constructor University.

Admission to Constructor University is selective and based on a candidate's university achievements, recommendations and self-presentation. Students admitted to Constructor University demonstrate exceptional academic achievements, intellectual creativity, and the desire and motivation to make a difference in the world.

The following documents need to be submitted with the application:

- Letter of motivation
- Curriculum vitae (CV)
- Official or certified copies of university transcripts
- Bachelor's degree certificate or equivalent
- Language proficiency test results (minimum score of 90 (TOEFL), 6.5 (IELTS) or 110 (Duolingo)).
- Copy of Passport
- Letter of recommendation (optional).

Formal admission requirements are subject to higher education law and are outlined in the Admission and Enrollment Policy of Constructor University.

For more detailed information about the admission visit:
Application Information | Constructor University

1.7 More information and contacts

For more information on the study program please contact the Study Program Coordinator:

Prof. Dr. Yilmaz Uygun

Professor of Logistics Engineering, Technologies, and Processes

Email: yuygun@constructor.university

or visit our program website: Supply Chain Management | Constructor University

For more information on Student Services please visit:
https://constructor.university/student-life/student-services

2 The Curriculum

2.1 The Curriculum at a Glance

The Supply Chain Management curriculum is divided into four semesters and takes two years to complete. Each semester is composed of a mixture of core, research & discovery, math & methods, and career modules, leading to a master's thesis that may be conducted in collaboration with an industry partner.

The first semester is a foundational semester, during which students from different educational and cultural backgrounds get acquainted with general methods and knowledge about supply chains and logistics as well as data analytics, programming, language, and soft skills, which are essential for the further development of their studies. The second semester focuses strongly on the different facets of supply chains, such as design, purchasing, and distribution. The third semester introduces students to complex tasks in science and industry. Here, they can combine modules that best fit their abilities and interests. Students are expected to demonstrate the capability to self-organize the preparation of solutions for the theoretical and practical scientific problems of an industrial partner. During the fourth and final semester, students work on their master's thesis.

The modules are grouped into five areas, as outlined in the Schematic Study Plan (see figure 1). In the third semester, students choose three mandatory elective modules (out of the list of mandatory electives in the core area).

2.1.1 Core Area: 30 CP

To pursue an SCM master, the following Core modules (30 CP) need to be taken as mandatory modules (m):

- CORE Module: Business Intelligence (m, 5 CP)
- CORE Module: Supply Chain Management and Logistics (m, 5 CP)
- CORE Module: Big Data Challenge (m, 5 CP)
- CORE Module: Trends & Challenges in Supply Chain Management (m, 5 CP)
- CORE Module: Advanced Supply Chain Management (m, 5 CP)
- CORE Module: Purchasing and Distribution (m, 5 CP)

2.1.2 Research and Discovery Area: 15 CP

To pursue an SCM master, the following Research and Discovery modules (30 CP) need to be taken as mandatory modules (m):

- Research and Discovery Module: Applied Modeling & Simulation (m, 5 CP)
- Research and Discovery Module: Supply Chain Engineering (m, 5 CP)
- Research and Discovery Module: Research Project (m, 5 CP)

2.1.3 Math and Methods Area: 15 CP

To pursue an SCM master, the following Math and Methods modules (30 CP) need to be taken as mandatory modules (m):

- Math and Methods Module: Programming in Python (m, 5 CP)
- Math and Methods Module: Research Methods (m, 5 CP)
- Math and Methods Module: Supply Chain Optimization (m, 5 CP)

2.1.4 Career Area: 15 CP

To pursue an SCM master, the following Career modules (30 CP) need to be taken as mandatory modules (m):

- Career Module: Communicating and Presenting (m, 5 CP)
- Career Module: Language Skills I (m, 2.5 CP)
- Career Module: Sustainable & Ethical Business in Germany (m, 5 CP)
- Career Module: Language Skills II (m, 2.5 CP)

2.1.5 Elective Area: 15 CP

To pursue a SCM master, students choose the following Electives modules (15 CP) as mandatory elective modules (me):

- Electives Module: Data Analytics in Supply Chain Management (me, 5 CP)
- Electives Module: Sustainable Cities and Transportation (me, 5 CP)
- Electives Module: Applied Project Management (me, 5 CP)
- Electives Module: Digital Transformation and Innovation (me, 5 CP)
- Electives Module: Artificial Intelligence in Business and Society (me, 5 CP)

Students can replace two modules from the Elective Area with an internship.

See section 6.1.20 in the handbook.

3 Supply Chain Management Graduate Program Regulations

3.1 Scope of these Regulations

The regulations in this handbook are valid for all students who entered the Supply Chain Management graduate program at Constructor University in Fall 2026. In case of conflict between the regulations in this handbook and the general Policies for Master Studies, the latter apply (see Academic policies | Constructor University).

In exceptional cases, certain necessary deviations from the regulations of this study handbook might occur during the course of study (e.g., change of the semester sequence, assessment type, or the teaching mode of courses).

Updates to Study Program Handbooks are based on the policies approved by the Academic Senate on substantial and non-substantial changes to study programs. Students are integrated in the decision-making process through their respective committee representatives. All students affected by the changes will be properly informed.

In general, Constructor University therefore reserves the right to change or modify the regulations of the program handbook also after its publication at any time and in its sole discretion.

3.2 Examination Concept

According to the Policies for Bachelor and Master studies, modules generally carry at least five ECTS. Each program ensures appropriate examination frequency and organization, justified in an examination concept and regularly reviewed with student involvement.

Constructor University's examination concept follows the principle of Constructive Alignment (Biggs 1996), ensuring that learning outcomes, activities, and assessments are consistently aligned: students learn what is intended, and assessments both measure and shape learning. Where one assessment cannot cover all Intended Learning Outcomes (ILOs) complementary forms could be used (e.g., written exams plus lab reports). Module descriptions map ILOs to assessments.

In specific contexts, such as asynchronous online modules or courses emphasizing student engagement, Module Achievements or other types of formative assessments may support competence-oriented assessment.

Student feedback, embedded in the Quality Assurance System (QAS), systematically monitors workload, competence orientation, and alignment of ILOs and assessments. Student surveys and feedback are regulated in the Policy for student surveys and evaluations.

3.3 Degree

Upon successful completion of the study program, students are awarded a Master of Science (MSc) degree in Supply Chain Management.

3.4 Graduation Requirements

In order to graduate, students need to obtain 120 credit points. In addition, the following graduation requirements apply:

- Students need to complete all mandatory components of the program as indicated in chapter 2 of this handbook.

3.5 Other Program-specific Policies & Practices

Close contact and cooperation between program representatives and students are crucial. Therefore, regular meetings are held to continuously evaluate the program, its modules and workshops, supervision, and opportunities. In doing so, the program chair and involved faculty gain important insights into students' experiences, demands, and overall impressions of the program. On the module component level, students are asked to perform module component evaluations to ensure that the modules are high-quality and that lecturers can make any necessary changes.

The study program chair makes intensive use of this feedback as well as feedback from industry partners to improve the learning environment, the program's offering, and its progress. The current program was shaped through input from previous experiences and discussions with several stakeholders, including students and industry practitioners.

In exceptional cases, certain necessary deviations from the regulations of this study handbook might occur during the course of study (e.g., change of the semester sequence, assessment type, or the teaching mode of courses). Constructor University reserves therefore the right to modify the regulations of the program handbook.

4 Schematic Study Plan for Supply Chain Management

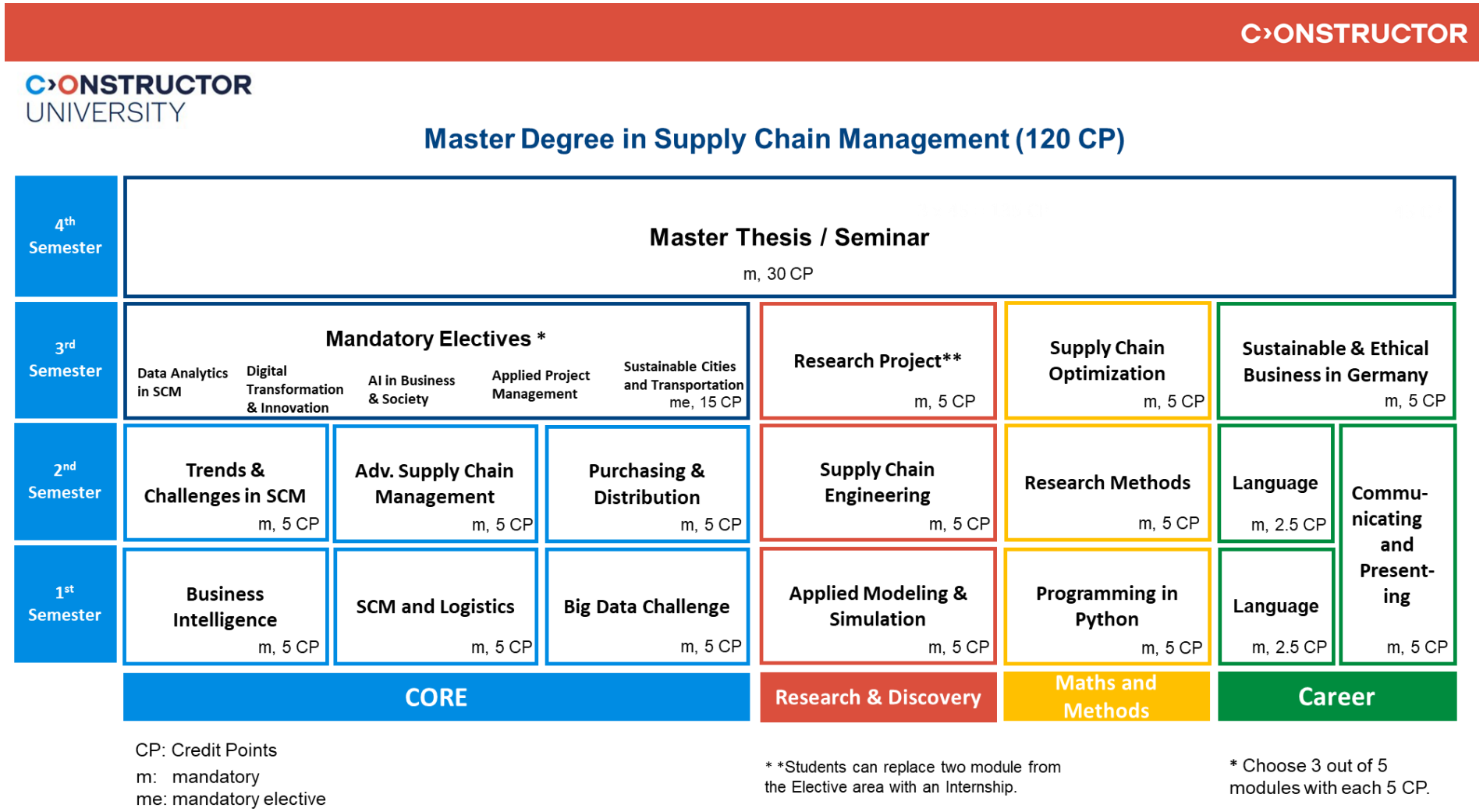

Figure 1: Schematic Study Plan for Supply Chain Management

5 Study and Examination Plan

MSc Degree in Supply Chain Management Matriculation Fall 2026							
Module Code	**Program-Specific Modules**	**Type**	**Assessment**	**Period[1]**	**Status[2]**	**Semester**	**CP**
Semester 1							**30**
	CORE Area						**15**
MSCM-CO-11	**Business Intelligence**				**m**	**1**	**5**
MSCM-CO-11	Business Intelligence	Lecture	Project Report	During semester			
MSCM-CO-02	**Module: Supply Chain Management and Logistics**				**m**	**1**	**5**
MSCM-CO-02	Supply Chain Management and Logistics	Lecture	Written examination	Examination period			
MDE-CO-01	**Module: Big Data Challenge**				**m**	**1**	**5**
MDE-CO-01	Big Data Challenge	Lecture	Project Report	During semester			
	Math & Methods Area						**5**
MSCM-MET-01	**Module: Programming in Python**				**m**	**1**	**5**
MSCM-MET-01	Programming in Python	Lecture	Project Report	Examination period			
	Research & Discovery Area						**5**
MSCM-RD-01	**Applied Modeling and Simulation**				**m**	**1**	**5**
MSCM-RD-01	Applied Modeling and Simulation	Lecture&Lab	Project report	During semester			
	CAREER						**5**
MSCM-CAR-01	**Module: Communicating and Presenting (to be continued in semester 2)**				**m**	**1**	**2.5**
MSCM-CAR-01-A	Communication and Presentation Skills for Executives	Lecture	Oral presentation	During semester			
CTLA-	**Module: Language 1**				**m**	**1**	**2.5**
	German is the default language. Native German speakers take modules in another offered language.						
CTLA-	Language 1	Seminar	Various	Various	**me**		
Semester 2							**30**
	CORE Area						**15**
MSCM-CO-03	**Module: Trends & Challenges in Supply Chain Management**				**m**	**2**	**5**
MSCM-CO-03	Trends & Challenges in Supply Chain Management	Seminar	Project report	During semester			
MSCM-CO-04	**Module: Advanced Supply Chain Management**				**m**	**2**	**5**
MSCM-CO-04	Advanced Supply Chain Management	Seminar	Project report	During semester			
MSCM-CO-05	**Module: Purchasing & Distribution**				**m**	**2**	**5**
MSCM-CO-05-B	International Purchasing	Seminar	Term paper	During semester			**2.5**
MSCM-CO-05-A	Distribution Logistics	Seminar	Term paper	During semester			**2.5**
	Math & Methods Area						**5**
MSCM-MET-02	**Module: Research Methods**				**m**	**2**	**5**
MSCM-MET-02	Research Methods	Lecture	Written Examination	Examination period			**5**
	Research & Discovery Area						**5**
MSCM-RD-02	**Module: Supply Chain Engineering**				**m**	**2**	**5**
MSCM-RD-02	Supply Chain Engineering	Lecture & Seminar	Project Report & Written examination	During semester & Examination period			
	CAREER						**5**
MSCM-CAR-01	**Module: Communicating and Presenting (continuation from semester 1)**				**m**	**2**	**2.5**
MSCM-CAR-01-B	Academic Writing	Lecture	Term paper	During semester			
CTLA-	**Module: Language 2**				**m**	**2**	**2.5**
CTLA-	Language 2	Seminar	Various	Various	**me**		

Semester 3							**30**
	CORE Area (choose 3 modules)						**15**
MSCM-CO-07	**Module: Data Analytics in Supply Chain Management**				**me**	**3**	**5**
MSCM-CO-07	Data Analytics in Supply Chain Management	Lecture	Project report	During semester			
MSCM-CO-08	**Module: Sustainable Cities and Transportation**				**me**	**3**	**5**
MSCM-CO-08	Sustainable Cities and Transportation	Lecture	Project report	During semester			
MDSSB-DSAI-02	**Module: Artificial Intelligence in Business and Society**				**me**	**3**	**5**
MDSSB-DSAI-02	Artificial Intelligence in Business and Society	Lecture/Lab	Project report	During semester			
MDSSB-DSAI-01	**Module: Digital Transformation and Innovation**				**me**	**3**	**5**
MDSSB-DSAI-01-A	Digital Transformation of Organizations	Seminar	Term Paper	During semester			2.5
MDSSB-DSAI-01-B	Digital Services and Innovation	Seminar					2.5
MSCM-CO-01	**Module: Applied Project Management**				**me**	**3**	**5**
MSCM-CO-01	Applied Project Management	Lecture	Project Report	During semester			
	Math & Methods Area						**5**
MSCM-MET-04	**Module: Supply Chain Optimization**				**m**	**3**	**5**
MSCM-MET-04	Supply Chain Optimization	Lecture	Written examination	Examination period			
	Research & Discovery Area						**5**
MSCM-RD-03	**Module: Research Project**				**m**	**3**	**5**
MSCM-RD-03	Research Project	Seminar	Term paper	During semester			
	CAREER						**5**
MSCM-CAR-02	**Module: Sustainable & Ethical Business in Germany**				**m**	**3**	**5**
MSCM-CAR-02-A	Sustainable Business in Germany	Lecture	Written examination	Examination period			**2.5**
MSCM-CAR-02-B	Business Ethics	Lecture	Term paper	During semester			**2.5**
MSCM-INT-01	**Internship**				**me**	**3**	**10**
MSCM-INT-01	Internship	Project/Internship	Project Report				
Semester 4							**30**
	Master Thesis						**30**
MSCM-THE-01	**Module: Master Thesis MSc SCM**				**m**	**4**	**30**
MSCM-THE-01	Master Thesis			15th of May			
Total CP							**120**

[1] Each lecture period lasts 14 semester weeks and is followed by reading and examination days. Written examinations are centrally scheduled during weeks 15 and 16. For all other assessment types, the timeframes indicated in the

[2] m = mandatory, me = mandatory elective

[3] Module consists of two mandatory module components, which are offered in semester 1 and semester 2 respectively.

Figure 2: Study and Examination plan

6 Modules

6.1.1 Business Intelligence

Module Name	Business Intelligence
Module Code	MSCM-CO-11
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
MBA-120-MA MBA 120	1	Mandatory Elective
MBA-60-MA MBA 60	1	Mandatory Elective
SCM-MSc Supply Chain Management	1	Mandatory

Student Workload	
Lecture	35
Group Discussion	45
Independent Study	45
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Business Intelligence	MSCM-CO-11	Lecture	5

Module Description

Business Intelligence (BI) refers to the process of collecting, analyzing, and presenting data to support business decision-making. BI involves the use of software tools and techniques to gather data from various company-wide sources and databases and transform it into meaningful insights and reports to provide decision-makers with accurate and up-to-date information that can be used to make strategic decisions. BI can help businesses identify trends, opportunities, and areas for improvement, and can be used in a variety of areas, such as sales and marketing, finance, operations, and human resources.

Some common BI techniques and tools include, but are not limited to:

- data mining
- data warehousing
- reporting
- dashboarding

Recommended Knowledge

- Basics of statistical analytics and Basics of database and SQL

Intended Learning Outcomes

No	Competence	ILO
1	Discuss	Discuss different definitions and terms commonly used in BI
2	Evaluate	Evaluate how BI can help make better decisions
3	Apply	Apply software tools and techniques to perform data analyses and reporting
4	Compare	Compare and contrast different BI techniques and their contribution to successful decision making
5	Integrate	Integrate BI in logistics and SCM processes to understand and analyze real-world problems

Indicative Literature

- Sharda, R.; Delen, D.; Turban,E.; King, D. (2017): Business Intelligence: A Managerial Approach, Global Edition. Person Education.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Business Intelligence	Project Report	2500 words	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.2 Supply Chain Management and Logistics

Module Name	Supply Chain Management and Logistics
Module Code	MSCM-CO-02
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Stanislav Chankov

Study Semester		
Program	**Semester**	**Status**
MBA-120-MA MBA 120	1	Mandatory Elective
MBA-60-MA MBA 60	1	Mandatory Elective
SCM-MSc Supply Chain Management	1	Mandatory

Student Workload	
Lecture	35
Independent Study	90
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Supply Chain Management and Logistics	MSCM-CO-02	Lecture	5

Module Description

The focus of this module is to provide a holistic perspective on logistics and supply chain management in terms of processes, function, conflicting targets, key terms and definitions, and main methods.

The module is structured in three main parts:

- Logistics Processes – covers the procurement, production, and distribution processes.

- Logistics Management - covers inventory management, logistics service providers and lean management.

- Supply Chain Management – covers cross-company management aspects and supply chain strategies.

Recommended Knowledge

- Logical and analytical skills

Usability and Relationship to other Modules

This module is the pre-requisite for several other modules, i.e., MSCM-CO-03 Trends & Challenges in SCM, MSCM-CO-04 Advanced Supply Chain Management, MSCM-CO-05 Purchasing & Distribution, MSCM-RD-02 Supply Chain Engineering. Project management concepts taught in MSCM-CO-01 will be applied

Intended Learning Outcomes

No	Competence	ILO
1	Discuss	Discuss the definitions and terms commonly used in the logistics and supply chain management realm
2	Evaluate	Evaluate how logistics and supply chain operations impact the economic success of a company
3	Analyze	Analyze the processes and strategies of procurement, production, and distribution logistics
4	Develop	Develop solutions to logistics problems by applying different methods and tools for analyzing and improving logistics/supply chain processes
5	Evaluate	Evaluate how economic and industry trends impact the logistics and supply chain performance of production and service provider companies
6	Compare	Compare and contrast different supply chain strategies and their applicability to different settings
7	Integrate	Integrate knowledge in logistics and SCM to solve different case studies and real-world problems

Indicative Literature

- Andersen, M., & Skjoett-Larsen, T. (2009). Corporate social responsibility in global supply chains. Supply Chain Management: An International Journal,14(2), 75-86.
- Cooper, M. C., Lambert, D. M., & Pagh, J. D. (1997). Supply chain management: more than a new name for logistics. The international journal of logistics management, 8(1), 1-14.
- DHL Trend Research (2025), Logistics Trend Radar, DHL Customer Solutions & Innovation, https://www.dhl.com/fr-en/home/innovation-in-logistics/logistics-trend-radar.html
- Feitzinger, E., & Lee, H. L. (1997). Mass customization at Hewlett-Packard: the power of postponement. Harvard business review, 75, 116-123.
- Marasco, A. (2008). Third-party logistics: A literature review. International Journal of production economics, 113(1), 127-147
- Nix, N. W. (2001). Purchasing in a supply chain context. Supply Chain Management, 205-235.
- Nyhuis, P., & Wiendahl, H. P. (2006). Logistic production operating curves–basic model of the theory of logistic operating curves. CIRP Annals-Manufacturing Technology, 55(1), 441-444.
- Nyhuis, P., & Wiendahl, H. P. (2008). Fundamentals of production logistics: theory, tools and applications. Springer Science & Business Media.

Entry Requirements

Prerequisites	None
Co-requisites	MSCM-RD-01 Applied Modeling & Simulation
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Supply Chain Management and Logistics	Written Examination	120 Minutes	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.3 Big Data Challenge

Module Name	Big Data Challenge
Module Code	MDE-CO-01
Module ECTS	5
Program Owner	DE-MSc (Data Engineering)
Module Coordinator	Prof. Dr. Adalbert F.X. Wilhelm

Study Semester		
Program	**Semester**	**Status**
DE-MSc Data Engineering	1	Mandatory
MBA-120-MA MBA 120	1	Mandatory Elective
MBA-60-MA MBA 60	1	Mandatory Elective
SCM-MSc Supply Chain Management	1	Mandatory

Student Workload	
Lecture	17.5
Project Work	90
Independent Study	17.5
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Big Data Challenge	MDE-CO-01	Lecture	5

Module Description

Big data is one of the buzz words of the current decade and refers to the collection and exploration of complex data sets. This complexity of big data is typically described by the four V's: Volume, Velocity, Variety, and Veracity. From a business perspective, big data is often portrayed as a sea of big opportunities. The public debate is torn between the two poles portrayed by the writers George Orwell and Aldous Huxley: complete surveillance resulting in oppression on the one end, and irrelevance and narcissism on the other. Technological research quite naturally is mostly concerned with the technical feasibility of different approaches, the continuously increasing challenges with respect to the four V's, and the creative solutions needed to tackle them.

In this module students receive an overview of big data by looking at it from various perspectives, primarily from the business and societal points of view. The focus is not on the technical methods and skills, but on case studies that show big data and data engineering in a cross-section.

Recommended Knowledge

- Researching information, assessing sources and report writing

- Watch Susan Ettlinger (2015). What Do we do with all this Big Data? Altimeter. https://www.ted.com/talks/susan_etlinger_what_do_we_do_with_all_this_big_data?geo=de

- Watch intro to Data Engineering https://youtu.be/qWru-b6m030?si=THu1TYgWyOYqFGGl

Usability and Relationship to other Modules

- For DE: This module provides an overview on practical big data applications. The computational details will then be studied in MDE-CS-04.

- For SCM: Concepts are applied in MSCM-CO-03 Trends & Challenges in Supply Chain Management. Project management concepts taught in MSCM-CO-01 will be applied. Academic writing skills taught in MSCM-CAR-01 facilitate the completion of the tasks in this module.

Intended Learning Outcomes

No	Competence	ILO
1	Contribute	Contribute knowledgeably to the current debate about big data, digitalization and industry 4.0.
2	Explain	Explain and discuss pros and cons of digitalization from a business perspective as well as a societal perspective.
3	Perform	Perform a SWOT analysis on current big data initiatives.
4	Evaluate	Evaluate technological possibilities and innovations driven by big data.
5	Assess	Assess the business opportunities of current big data developments.

Indicative Literature

- McLellan (2013): Big Data: An Overview https://www.zdnet.com/article/big-data-an-overview/
- S. Akter & S. Fosso Wamba, Big data analytics in e-commerce: A systematic review and agenda for future research, 2016. Electronic Markets, 26 173-194.
- Z. Lv, H. Song, P. Basanta-Val, A. Steed and M. Jo. "Next-Generation Big Data Analytics: State of the Art, Challenges, and Future Research Topics," in IEEE Transactions on Industrial Informatics, vol. 13, no. 4, pp. 1891-1899, Aug. 2017.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Big Data Challenge	Project Report	2500 words	100	45%	1-5

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.4 Trends & Challenges in Supply Chain Management

Module Name	Trends & Challenges in Supply Chain Management
Module Code	MSCM-CO-03
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	2	Mandatory

Student Workload	
Seminar	35
Group Discussion	45
Independent Study	45
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Trends & Challenges in Supply Chain Management	MSCM-CO-03	Seminar	5

Module Description

Manufacturing and logistics systems are subject to permanent technological advances. Progress in manufacturing and logistics technologies for processing, handling, transport, and warehousing are reshaping processes and structures.

This module deals with current and near-future technologies used in manufacturing and logistics systems. These are cross-cutting technologies that touch upon different skills, departments, and disciplines and show a high degree of complexity that need to be managed. This module also looks at select technologies under development and in early stages of application in laboratories and in industrial innovation centers by analyzing their potential and limitations and their effects on current supply chains and manufacturing systems.

Recommended Knowledge

- Researching information, assessing sources, verbal communication skills

Usability and Relationship to other Modules

Aspects taught in both MDE-CO-01 Big Data Challenge and MSCM-CO-02 Supply Chain Management and Logistics as well as project management concepts taught in MSCM-CO-01 will be applied. Academic writing skills in MSCM-CAR-01 facilitate the completion of the tasks in this module.

Intended Learning Outcomes

No	Competence	ILO
1	Assess	Assess the effects of complex technologies on manufacturing and logistics systems
2	Integrate	Integrate knowledge on trends in supply chains and logistics issues
3	Investigate	Investigate new trends in SCM independently and holistically.
4	Develop	Develop alternative approaches to SCM issues
5	Derive	Derive the costs and benefits of these technologies
6	Analyze	Analyze the potential of new cross-cutting technologies and communicate them clearly to stakeholders
7	Manage	Manage the change requirements posed by new technologies
8	Apply	Apply project management tools to effectively work in teams to perform group project tasks

Indicative Literature

- MacCarthy, B.L., Ivanov, D. (2022): The Digital Supply Chain. 1st Edition. Elsevier.

Entry Requirements

Prerequisites	MSCM-CO-02 Supply Chain Management and Logistics MDE-CO-01 Big Data Challenge
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Trends & Challenges in Supply Chain Management	Project Report	2500 words	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.5 Advanced Supply Chain Management

Module Name	Advanced Supply Chain Management
Module Code	MSCM-CO-04
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
MBA-120-MA MBA 120	2	Mandatory Elective
SCM-MSc Supply Chain Management	2	Mandatory

Student Workload	
Seminar	35
Group Discussion	45
Independent Study	45
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Advanced Supply Chain Management	MSCM-CO-04	Seminar	5

Module Description

Ensuring seamless material flows along globalized and digitalized supply chains is becoming increasingly challenging. Supply chain managers require information and planning systems that are capable of properly planning, scheduling, and controlling material flows across different locations. Thus, such planning systems (e.g., SAP Integrated Business Planning) are an important asset in today´s supply chains.

In this module, students will deal with challenges imposed by such global and digitalized supply chains by using specific software. By using this software, students will learn how best to plan, monitor, and control processes in operations, demand, and inventory planning by considering planning models and user roles. They will understand both the possibilities and limits of such software through hands-on exercises and case studies that they will solve by using it.

Recommended Knowledge

- Researching information, assessing sources, verbal communication skills

Usability and Relationship to other Modules

This module complements MSCM-CO-02 Supply Chain Management and Logistics by using a complex planning system in supply chains

Intended Learning Outcomes

No	Competence	ILO
1	Work	Work with supply chain-related advanced planning systems to efficiently manage supply chains
2	Configure	Configure and use different applications, such as operations, demand, supply, and inventory planning applications
3	Measure	Measure progress using specified control tools
4	Set up	Set up and deploy such software in a company´s IT landscape

Indicative Literature

- Saueressig, T., Gilg, J., Grigoleit, U., Shah, A., Podbicanin, A., Homann, M. (2022): SAP S/4HANA Cloud - Funktionen, Nutzen, Erfolgsfaktoren. Rheinwerk Publishing / SAP Press

Entry Requirements

Prerequisites	MSCM-CO-02 Supply Chain Management and Logistics
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Advanced Supply Chain Management	Project Report	2500 words	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.6 Purchasing and Distribution

Module Name	Purchasing and Distribution
Module Code	MSCM-CO-05
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
MBA-120-MA MBA 120	2	Mandatory Elective
SCM-MSc Supply Chain Management	2	Mandatory

Student Workload	
Seminar	35
Group Discussion	45
Independent Study	45
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
International Purchasing	MSCM-CO-05-B	Seminar	2.5
Distribution Logistics	MSCM-CO-05-A	Seminar	2.5

Module Description

This module covers two main aspects of supply chain management: purchasing and distribution.

The first part of the module deals with purchasing as a part of the entire business as well as with the prerequisites for profitable business overall. This part is based on group work and discussions, with a focus on collaborative approaches and on understanding and developing these approaches throughout the students' careers. The aim here is to gain a deep understanding of the possibilities and challenges procurement offers and faces in an organization. Another aim is to improve economic thinking skills and gain an understanding of how the key elements influence a business and its financial standing.

A major objective of the second part of the module is to equip students with a sound knowledge of processes and key business challenges within the field of distribution. Here, the evolution of distribution logistics from direct-to-store deliveries in the early 1970s up to same-day deliveries and omnichannel supply chains developed by companies today will be outlined. Based on that knowledge, new operational challenges imposed by e-commerce on the warehousing aspect of distribution logistics namely the emergence of e-fulfillment centers and the increasing importance of parcel and sorting delivery centers—will be addressed. Finally, last-mile-delivery concepts, with a focus on different business models (e.g., online retailers, the sharing economy), will be covered alongside the

associated challenges for traditional transport and distribution strategies and novel solution approaches.

The module addresses two distinct functional areas of supply chain management that require separate but equally rigorous assessment. The individual examination in Purchasing evaluates students' understanding of procurement principles, economic reasoning, and collaborative decision-making within organizations, while the individual examination in Distribution assesses structured knowledge of logistics processes, technological developments, and evolving distribution models. Separate exams ensure that students demonstrate competence in both domains without one area overshadowing the other, reflecting their independent relevance in professional supply chain practice.

Recommended Knowledge

- Logical thinking

Usability and Relationship to other Modules

This module deals in detail with purchasing and distribution concepts introduced in MSCM-C0-02 Supply Chain Management and Logistics and MSCM-CO-04 Advanced Supply Chain Management and concepts taught in MSCM-CO-01 will be applied. Academic writing skills in MSCM-CAR-01 facilitate the completion of the tasks in this module.

Intended Learning Outcomes

No	Competence	ILO
1	Assess	Assess critically and apply different purchasing models for an efficient supply of goods.
2	Develop	Develop purchasing strategies, plans and related processes in a global environment
3	Develop	Develop team working skills and ability to cooperate with the different people involved in purchasing
4	Think	Think economically and understand how the key elements in purchasing influence a business and its financial standing
5	Design	Design distribution systems by considering and combining different modes of transportation and warehousing
6	Evaluate	Evaluate critically and apply methods of efficiently running distribution processes.
7	Evaluate	Evaluate the challenges and opportunities warehouses and distribution centers are facing to fulfill specific requirements
8	Deal	Deal with the rising importance and complexity of last-mile deliveries and novel methods of tackling associated delivery problems
9	Investigate	Investigate solutions for complex delivery systems and develop alternative approaches independently.

Indicative Literature

- Van Weele, A. (2022): Purchasing and Supply Chain Management. 8th edition. Cengage Learning EMEA Publishing.

Entry Requirements

Prerequisites	MSCM-CO-02 Supply Chain Management and Logistics
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
International Purchasing	Term Paper	2500 words	50	45%	All intended learning outcomes of the module.
Distribution Logistics	Term Paper	2500 words	50	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Component Examination:** minimum pass 45% of each assessment.

Module Achievement

None.

6.1.7 Applied Modeling & Simulation

Module Name	Applied Modeling & Simulation
Module Code	MSCM-RD-01
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	1	Mandatory

Student Workload	
Lecture	17.5
Laboratory	17.5
Group Discussion	45
Independent Study	45
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Applied Modeling & Simulation	MSCM-RD-01	Lecture and Laboratory	5

Module Description

Decisions on the design and operation of logistics systems require a thorough understanding of the system's behavior. In many cases, logistics systems are too complex to allow one to develop analytical methods of predicting the system's behavior, and implementing any changes is risky for the overall performance of the system. Simulations can be used to derive insights into the behavior of complex systems before changes are implemented. In this module, students will learn how to develop and conduct simulation experiments to analyze the behavior of complex supply chain systems.

Throughout the module, different aspects of supply chains—such as production and material flow along the supply chain, distribution networks, and market diffusion—are modeled and simulated by applying discrete-event and agent-based modeling techniques.

Students will prepare assignments as part of the project report based on the created models, and they will work on a final group project dealing with a complex problem.

Recommended Knowledge

- Basic software knowledge, analytical skills, verbal communication skills

Usability and Relationship to other Modules

Aspects of MSCM-CO-02 Supply Chain Management and Logistics are foundational for modeling purposes and project management concepts taught in MSCM-CO-01 will be applied. Academic writing and communication skills taught in MSCM-CAR-01 facilitate the completion of the tasks in this module.

Intended Learning Outcomes

No	Competence	ILO
1	Model	Model highly dynamic supply chain systems
2	Apply	Apply different simulation methods (especially discrete-event and agent-based methods) to design and analyze processes
3	Investigate	Investigate bottlenecks and inefficiencies in such complex systems independently.
4	Analyze	Analyze the results of simulation runs and clearly communicate them to stakeholders
5	Find	Find and evaluate alternative solutions to bottlenecks and other issues in complex logistics systems independently by changing parameters and the overall system design.
6	Make	Make substantiated and data-based decisions by overseeing the impacts on the overall logistics system thanks to detailed simulation results
7	Justify	Justify selected solutions by using and communicating the optimal simulation result
8	Apply	Apply project management tools to effectively work in teams to solve complex problems

Indicative Literature

- NoneBorshchev, A. & Grigoryev, I. (2024): The Big Book of Simulation Modeling - Multimethod Modeling with AnyLogic 8.

Entry Requirements

Prerequisites	None
Co-requisites	MSCM-CO-02 Supply Chain Management and Logistics
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Applied Modeling & Simulation	Project Report	2500 words	100	45%	All intended

					learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.8 Supply Chain Engineering

Module Name	Supply Chain Engineering
Module Code	MSCM-RD-02
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Stanislav Chankov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	2	Mandatory

Student Workload	
Lecture	17.5
Seminar	17.5
Group Discussion	45
Independent Study	45
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Supply Chain Engineering	MSCM-RD-02	Lecture and Seminar	5
	MSCM-RD-02		

Module Description

Supply Chain Engineering is concerned with the design of the supply chain network and the use of mathematical models and methods to determine the optimal strategies for managing the supply chain. Accordingly, this module has two components: application of mathematical models from operations research and integrated decision making in supply chain management.

In the first part of the module, students will learn how to find optimal or near-optimal solutions to complex decision-making problems in supply chain management by employing techniques such as mathematical modeling, statistical analysis, and mathematical optimization from the field of operations research. This part of the module introduces students to modeling of decision problems and the use of quantitative methods and techniques for effective decision-making in supply chain management on topics such as: supplier selection, development, demand forecasting, production planning, transportation problems and vehicle routing.

In the second part of the module students play the Fresh Connection game. The Fresh Connection is an innovative web-based business simulation that delivers the ultimate supply chain learning experience. It engages participants in making strategic decisions in the management of a manufacturing company of fruit juices. Working in teams of four, participants represent the functional roles of sales, purchasing, supply chain and operations. They are confronted with various real-life, real-time dilemmas and render typical supply chain management decisions (e.g., supplier selection,

production capacity planning, inventory management, supply chain risk management, supply chain sustainability, etc.). Thereby, students learn how to use information in decision-making and how to handle risk and uncertainty. Thus, they experience the power of true alignment and a well-articulated supply chain strategy, supported by tactical skills and knowledge.

A single assessment type cannot sufficiently test all intended learning outcomes. The project report evaluates practical skills related to Integrated Decision Making in SCM, whereas the written examination assesses understanding of core Mathematical Modeling concepts.

Recommended Knowledge

-Basic knowledge in spreadsheet software

- Ravindra, A. R. & Warsing Jr., D. (2012): Supply Chain Engineering – Models and Applications. CRC Press

Usability and Relationship to other Modules

Extends MSCM-CO-02 Supply Chain Management and Logistics by explicitly looking at design and control aspects of SCM and project management concepts taught in MSCM-CO-01 will be applied. Academic writing skills taught in MSCM-CAR-01 facilitate the completion of tasks in this module.

Intended Learning Outcomes

No	Competence	ILO
1		Mathematical Modeling in SCM
2	Develop	Develop mathematical models for supply chain management problems and derive optimal or near-optimal solutions to them using operations research methods
3	Apply	Apply common network optimization problems such as transportation, shortest path, minimum spanning tree, and maximum flow problems to supply chain situations
4	Integrate	Integrated Decision-making in SCM
5	Make	Make decisions in a high-pressure environment as part of a team
6	Formulate	Formulate and explain supply chain strategy and evaluate different suppliers and defend appropriate contract terms in a global supply chain environment
7	Design	Design appropriate techniques for capacity planning in warehouses and production, inventory management and demand forecasting
8	Create	Create supply chain risk management strategy to mitigate global supply chain risks
9	Construct	Construct a sustainable supply chain considering both economic and environmental factors
10	Develop	Develop project management tools to effectively work in teams in order to perform a task

Indicative Literature

- Dolgui, A. & Proth, J.-M. (2010): Supply Chain Engineering. Springer
- Fisher, M.L. (1997): What is the right supply chain for your product?, Harvard Business Review
- Goetschalckx, M. (2011): Supply Chain Engineering. Springer
- Hillier, F. S. & Lieberman, G. J. (2010): Introduction to Operations Research. McGraw-Hill
- Kraljic, P. (1983) Purchasing must become Supply Management, Harvard Business Review
- Ravindra, A. R. & Warsing Jr., D. (2012): Supply Chain Engineering – Models and Applications. CRC Press.
- Slack, N., Chambers, S. & Johnston, R. (2016): Operations Management. Pearson Education Limited.
- Wallace, T. F. (2011): Sales and Operations Planning: Beyond the Basics. Steelwedge Software

Entry Requirements

Prerequisites	MSCM-CO-02 Supply Chain Management and Logistics
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Supply Chain Engineering	Written Examination	120 min	50	Ø 45% of component 1 and 2	Intended learning outcomes of Mathematical Modeling in SCM.
	Project Report	2500 words	50		Intended learning outcomes of Integrated Decision-making.

Module Completion Requirements

- **Module Examination:** weighted average grading of both assessments.

Module Achievement

None.

6.1.9 Research Project

Module Name	Research Project
Module Code	MSCM-RD-03
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	3	Mandatory

Student Workload	
Seminar	35
Independent Study	90
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Research Project	MSCM-RD-03	Seminar	5

Module Description

Supply Chain Management graduates need to develop research skills, not only to prepare for their master's thesis but also because many graduates pursue an academic career. Thus, profound research skills as of utmost importance.

Content-wise, many industries are characterized by complex and highly interdependent supply stages. This raises issues of vertical and horizontal coordination, competition, and market design, as well as regulation. Focusing on a specific example of such a complex industry, this module deals with value chain management issues, analyzing theoretical and practical questions from the viewpoint of economics and business administration.

Typical research questions concern the general market structure of the industry. What are the competition and regulation issues in the industry? How critical is vertical and/or horizontal coordination, and how are information flows and coordination handled along the supply chain? What are the possible vertical integration or fragmentation problems in the sector? Are there problems involving risks and cost structures, ownership, investments, or innovation?

This seminar requires the students to work in small groups to prepare a research paper on value chain management and analyze specific economic issues in the selected industry based on applied scientific literature and methods. The main aim is to learn to think independently and critically.

Recommended Knowledge

- Good verbal and written communication skills

Usability and Relationship to other Modules

Extends the academic writing skills taught in MSCM-CAR-01 with a focus on the preparation of MSCM-THE-01 Master Thesis.

Intended Learning Outcomes

No	Competence	ILO
1	Write	Write and review a research paper with an applied scientific background
2	Select	Select and evaluate the relevant literature
3	Assess	Assess the key arguments in the debate critically and independently
4	Develop	Develop an ability to conduct reasonable, reflective, and stringent argumentation
5	Communicate	Communicate precisely in a concise and clear manner at an academic level
6	Communicate	Communicate in discussions and presentations in class with precision

Indicative Literature

- Saunders, M. et al. (2023): Research Methods for Business Students. 9th edition. Pearson

Entry Requirements

Prerequisites	MSCM-CAR-01 Communicating and Presenting
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Research Project	Term Paper	2500 words	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.10 Programming in Python

Module Name	Programming in Python
Module Code	MSCM-MET-01
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	1	Mandatory

Student Workload	
Lecture	35
Independent Study	90
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Programming in Python	MSCM-MET-01	Lecture	5

Module Description

Data analysis has become a central part of jobs in the supply chain industry. While routine tasks are often accomplished with standard spreadsheet software, more advanced analytical procedures require the use of programming languages. Python is one the most popular programming languages used by data analysts and data scientists. It has a broad spectrum of applicability, since Python was designed as a general-purpose programming language. As an open-source project, Python builds on a huge worldwide user and developer community, which has extended its capabilities. In this module, students will receive a solid introduction to this popular programming languages. SCM- and logistics-related examples will be used throughout the module.

Recommended Knowledge

- Logical thinking, analytical skills

Intended Learning Outcomes

No	**Competence**	**ILO**
1	Apply	Apply and perform data handling and data manipulation tasks in Python
2	Apply	Apply their knowledge to implement code in Python
3	Familiarize	Be familiar with the typical applications of Python in data science

Indicative Literature

- Severance, C.R.; Blumenberg, S.; Hauser, E. (2016): Python for Everybody: Exploring Data in Python 3. Create Space Independent Publishing Platform.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Programming in Python	Project Report	2500 words	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.11 Research Methods

Module Name	Research Methods
Module Code	MSCM-MET-02
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	2	Mandatory

Student Workload	
Exam Preparation	20
Lecture	35
Independent Study	70
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Research Methods	MSCM-MET-02	Lecture	5

Module Description

This module consists of both qualitative and quantitative research methods.

The latter provide students with essential background in the concepts and methods of econometrics beyond the introductory level. The module component will cover linear regression, regression for limited dependent variables, time series, and panel data modelling. Given today's widespread access to user-friendly and often open-source statistical software, the course will provide a stronger emphasis on the underlying logic and limitations of the methods rather than on their formal mathematical-statistical technicalities. It will thereby help students acquire the background knowledge, skills, and intuitive understanding necessary to implement and correctly interpret quantitative research, particularly in the field of supply chain management.

Qualitative research, the second component of this module, is concerned with meaning, such as the meaning events have for people, or the meaning of written texts or works of art. By applying qualitative methods, researchers seek to obtain an in-depth understanding of these meanings. This module component examines the methodological foundations of qualitative research the purposive sampling strategies suitable for an in-depth discovery of meaning, discusses how researchers acquire their data (e.g., through interviews, focus groups, observation), and reviews methods for the analysis of qualitative data (e.g., various types of coding, content analysis, discourse analysis, visual analysis). Emphasis is placed on examining the "quality of qualitative research," including the extent to which the traditional criteria of objectivity, reliability, and validity can be applied. This component of the

module is delivered partly as a seminar and partly as a lab where students apply the course methods to data drawn from their own fields of study. During the lab sessions, students are required to participate in and report on activities involving the application and trial of selected methods. Students will also develop, carry out, and report on small group research projects, fostering the integration of methodological knowledge about methods and designs with practical expertise in applying these methods. Lab sessions are run with small groups to ensure optimal supervision of research projects.

Recommended Knowledge

- Analytical skills

Usability and Relationship to other Modules

Academic writing skills taught in MSCM-CAR-01 facilitate the completion of the tasks in this module. Methods taught may be used in MSCM-THE-01 Master Thesis depending on the thesis topic.

Intended Learning Outcomes

No	Competence	ILO
1	Model	Model and formulate complex logistics problems as mathematical equations
2	Apply	Apply operations research methods, i.e., mathematical models, to solve complex problems
3	Prepare	Prepare and conduct qualitative research, such as interviews
4	Analyze	Analyze and contextualize the findings of qualitative research

Indicative Literature

- Varghese, K.A., Ranwah, B.R., Varghese, N., Varghese, N. (2025): Research Methodology and Quantitative Techniques - A Guide for Interdisciplinary Research. Routledge.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Research Methods	Written Examination	120 Minutes	100	45%	1-4

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.12 Supply Chain Optimization

Module Name	Supply Chain Optimization
Module Code	MSCM-MET-04
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Mahdi Homayouni

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	3	Mandatory

Student Workload	
Lecture	35
Independent Study	90
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Supply Chain Optimization	MSCM-MET-04	Lecture	5

Module Description

Supply chain optimization is a critical aspect of modern business operations, ensuring that organizations can deliver products and services efficiently while minimizing costs and maximizing customer satisfaction. This course provides students with a deep understanding of optimization techniques and their applications in supply chain management. It covers fundamental and advanced concepts related to supply chain design, planning, and execution, using data-driven methodologies and computational tools. Optimization techniques, such as linear and nonlinear programming, integer programming and mixed-integer programming, and dynamic programming and heuristic methods, will be addressed. Those will be used for inventory and demand optimization (economic order quantity models, multi-echelon inventory management, or demand forecasting and uncertainty management, etc.), transportation and logistics optimization (network design and route optimization, freight consolidation and warehouse location planning, etc.), production and distribution planning. Real-world case studies from various industries and optimization challenges faced by global supply chains round off this module.

Recommended Knowledge

- Logical thinking, analytical skills

Intended Learning Outcomes

No	Competence	ILO
1	Apply	Apply mathematical and computational techniques to solve optimization problems.
2	Enhance	Enhance decision-making through data analytics and predictive modeling.
3	Optimize	Optimize logistics, inventory, and production planning.

Indicative Literature

- Meng, D. & Zhu, S.-P. (2022): Multidisciplinary Design Optimization of Complex Structures Under Uncertainty. Routledge.

Entry Requirements

Prerequisites	MSCM-RD-02 Supply Chain Engineering
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Supply Chain Optimization	Written Examination	120 min	100	45%	All

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.13 Communicating and Presenting

Module Name	Communicating and Presenting
Module Code	MSCM-CAR-01
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	1	Mandatory
SCM-MSc Supply Chain Management	2	Mandatory

Student Workload	
Lecture	35
Independent Study	90
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Communication & Presentation Skills for Executives	MSCM-CAR-01-A	Lecture	2.5
Academic Writing	MSCM-CAR-01-B	Lecture	2.5

Module Description

Successful managers in the fields of logistics and supply chains need good skills in both written and verbal communication. This module accounts for that need.

Communication & Presentation Skills for Executives: An executive career in an international business environment requires excellent communication and academic writing skills. Managers have to communicate effectively with a large variety of target audiences, often in different languages and to people of different cultural backgrounds. This covers employees and/or direct reports, business partners, and customers. The ability to present and communicate succinctly and confidently while being culturally aware, building a rapport and trust with different audiences, is crucial. In this interactive module, students will be introduced to the basics of effective presentation and communication techniques. They will learn how to present themselves, their business project, or academic work with impact, tailoring both the content and their delivery style to different types of audiences.

Academic Writing: The academically rigorous nature of graduate studies requires students to master academic writing skills and techniques. In this introductory module component, students in the SCM master's program will learn the foundations of academic

writing at a graduate level, with a focus on writing academic essays, identifying organizational patterns in academic texts, and formulating arguments to produce cohesive and coherent academic papers. Students will improve their writing skills

through drafting, continuous feedback, and editing. This module component will also help students develop their research skills by highlighting techniques for finding and evaluating sources and utilizing citation and referencing styles. Adhering

to the Code of Academic Integrity is a requirement for graduate students. Hence, this module component will incorporate a session on the scholarly and intellectual standards set by Constructor University.

The two components in this module complement each other, with one part placing strong emphasis on communication and presenting information orally, and the second focusing on presenting and communicating academic information in a written form.

The module covers two distinct competencies: oral communication performance and written, structured communication, which cannot be adequately assessed through a single examination format. The oral examination evaluates live presentation skills such as clarity, audience engagement, and spontaneous response, while the term paper assesses analytical depth, argument structure, and reflective application of communication theory. Using both examination types ensures full alignment with the module's learning outcomes and professional communication requirements.

Recommended Knowledge

- Verbal and written communication skills

Usability and Relationship to other Modules

This module is foundational for several modules in which presentations and term papers are expected, such as MSCM-CO-01, MDE-CO-01, MSCM-CO-03, MSCM-CO-05, MSCM-CO-07, MSCM-CO-08, MSCM-CO-09, MSCM-RD-01, MSCM-RD-02 and of course MSCM-THE-01. The general foundations will be specified in MSCM-RD-03 to prepare for the MSCM-THE-01.

Intended Learning Outcomes

No	Competence	ILO
1	Apply	Apply methods in order to act as effective communicators in both group and individual situations
2	Integrate	Integrate interpersonal communication models and group dynamics in presentations
3	Build	Build rapport and trust with audiences
4	Use	Use presentation software (PowerPoint, Prezi) confidently and in a visually pleasant way
5	Structure	Structure presentations in a coherent manner and develop captivating narratives
6	Work	Work with different presentation formats (e.g., Ignite, Pecha Kucha, Pitching)

7	Apply	Apply the basics of logical reasoning in oral (deductive/inductive) presentations
8	Develop	Develop oratory and rhetorical skills drawing on Aristotle's teaching of logos, ethos, and pathos
9	Apply	Apply the basics of interpersonal communication (e.g., Johari Window, 4-Ears model)
10	Give	Give and receive constructive feedback
11	Present	Present themselves in different business situations
12	Collaborate	Collaborate effectively in intercultural teams
13	Write	Write different segments of an academic paper employing writing styles that display advanced grammar and precise and concise language use
14	Structure	Structure their ideas to write clear summaries, coherent paragraphs and cohesive literature reviews
15	Find	Find and evaluate sources for research successfully.
16	Use	Use citation and referencing styles applicable in their discipline
17	Adhere	Avoid unintentional plagiarism and adhere to the code of academic integrity

Indicative Literature

- Bailey, S. (2021): Academic Writing for University Students. Routledge.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	**Examination Type**	**Duration or Length**	**Weight (%)**	**Minimum for Pass**	**ILOs**
Communication & Presentation Skills for Executives	Oral Examination	30 minutes	50	45%	Intended learning outcomes of the module component Communication & Presentation Skills for Executives.
Academic Writing	Term Paper	2500 words	50	45%	Intended learning

					outcomes of the module component Academic Writing.

Module Completion Requirements

- **Module Component Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.14 Sustainable & Ethical Business in Germany

Module Name	Sustainable & Ethical Business in Germany
Module Code	MSCM-CAR-02
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Max Schlenker

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	3	Mandatory

Student Workload	
Lecture	17.5
Seminar	17.5
Group Discussion	17.5
Independent Study	72.5
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Sustainable Business in Germany	MSCM-CAR-02-A	Lecture	2.5
Business Ethics	MSCM-CAR-02-B	Lecture	2.5

Module Description

This module focuses on special aspects of business, preparing students for leading positions in the business world by establishing and navigating businesses, especially in the German business landscape, and also by considering ethical and sustainability issues in the German business context.

In the module component “Sustainable Business in Germany”, the course focuses on current topics in the German economic ecosystem. This helps students orientate themselves within Germany and understand the German business culture and landscape. Germany is an important logistics hub, and many international companies operate in the German market. Therefore, besides a solid command of the German language, good knowledge about Germany’s economy and institutions is also important as it prepares SCM students for both a career within Germany and an international career dealing with German suppliers and customers. Content-wise, the evolution and historical background of the German economy, starting with the German “Wirtschaftswunder” and proceeding to European integration with its implications for the economy and business life will be taught. Additionally, Germany’s current complex business landscape along with its major institutions and their relationships will be addressed. Then, on a corporate level, company-related structural aspects, such as legal forms and their pros and cons, will be discussed. This is also important for starting a business in Germany. All information is intended to embed students’ and graduates’ lives in Germany into contexts specific to the country. To reflect Germany's growing interest and investment in sustainability, topics related to

ecological, economic, and social sustainability will also be addressed by looking sustainability initiatives at the interplay of politics, industry and society. When feasible, parts of the component are conducted in German.

The second module component "Business Ethics" will address ethics issues, norms, and values in Germany. Ethics, or morality, concerns the principles, standards, rules, and norms of conduct that enable business cooperation and that allow companies to flourish. It provides a philosophically based touchstone for an ideal of justice, right relationships, and the proper use of power and authority. Ethical principles, rules, and regulations as well as sustainable business practices in Germany will be dealt with. Specific topics include the economic aspects of sustainability as well as the legal and ecological aspects of sustainability as they relate to business operations in Germany. Ethical principles concerning sustainability and digitalization (i.e., data security and privacy) as they relate to supply chain management in a global setting represent a useful and potentially critical component for preparing future professionals to be effective contributors to a company or society.

The module combines two complementary but methodologically different areas: factual, contextual knowledge of the German business and sustainability landscape and reflective, normative reasoning about ethics and responsibility. The written examination in "Sustainable Business in Germany" assesses students' structured understanding of economic history, institutions, legal forms, and sustainability frameworks in a concrete national context, where breadth and accuracy are essential. The term paper in "Business Ethics" allows students to critically analyze ethical principles, sustainability challenges, and value-based decision-making in depth, which cannot be adequately evaluated through a time-limited exam.

Recommended Knowledge

- Basic knowledge of German

Usability and Relationship to other Modules

The German classes in MCA002 – Language help to better understand specific contents in this module. Project

management concepts taught in MSCM-CO-01 will be applied.

Intended Learning Outcomes

No	Competence	ILO
1	Analyze	Analyze and interpret economic developments in Germany and their effects on business operations
2	Analyze	Analyze and (for startups) find the proper legal form for a company
3	Deal	Deal proactively with a number of different topics as they relate to the ethics and sustainability dimensions of supply chain management in Germany.
4	Assess	Assess the economic implications of ethical/unethical and sustainable/unsustainable behavior for the success and growth of a business

5	Deal	Deal with the legal aspects of ethics and sustainability by applying methods of preventing and dealing with corruption and accountability, especially in Germany
6	Apply	Apply measures to contribute to the transition to a more sustainable business and society as part of their job
7	Implement	Implement and defend justice and social equality as dimensions of ethics and sustainability

Indicative Literature

- Crane, A. et al. (2019): Business Ethics: Managing Corporate Citizenship and Sustainability in the Age of Globalization. 5th edition. Oxford Press

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Sustainable Business in Germany	Written Examination	60 Minutes	50	45%	All intended learning outcomes of the module.
Business Ethics	Term Paper	10 pages	50	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Component Examination:** minimum pass 45% of each assessment.

Module Achievement

None.

6.1.15 Data Analytics in Supply Chain Management

Module Name	Data Analytics in Supply Chain Management
Module Code	MSCM-CO-07
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Prof. Dr.-Ing. Hendro Wicaksono

Study Semester		
Program	**Semester**	**Status**
DE-MSc Data Engineering	3	Mandatory Elective
MBA-120-MA MBA 120	3	Mandatory Elective
SCM-MSc Supply Chain Management	3	Mandatory Elective

Student Workload	
Lecture	35
Group Discussion	45
Independent Study	45
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Data Analytics in Supply Chain Management	MSCM-CO-07	Lecture	5

Module Description

In recent years, big data has become a significant topic in supply chain management, as the amount of data generated in supply chain management practices has grown exponentially. Data analytics are techniques that apply data mining, statistical analysis, predictive analytics, and machine learning to uncover hidden patterns, correlations, trends, and other business-valuable information and knowledge from data.

The module focuses on the supply chain management scenarios that generate and consume data intensively and require data analytics to improve the decision-making process through descriptive, predictive, and prescriptive analytics. These include:

- Descriptive statistics on and historical insight into companies' production, financial, operations, sales, customers, etc.

- Forecasting customer behavior, purchasing patterns, production performance, energy consumption, etc.

- Prescriptive analytics for assessing the offer that should be made to a certain customer, to decide on the shipment strategy for each location, to determine the most efficient material flow in a factory, etc.

Recommended Knowledge

- Basics of statistical analytics and machine learning

- Basics of database and SQL

- Basics of programming skills, such as R, Python, and Java

Usability and Relationship to other Modules

Programming methods, such as R and Python, taught in MSCM-MET-01 Programming in Python and MSCM-MET-03 Programming in R as well as project management concepts taught in MSCM-CO-01 will be applied. Academic writing skills taught in MSCM-CAR-01 facilitate the completion of tasks in this module.

Intended Learning Outcomes

No	Competence	ILO
1	Identify	Identify scenarios in supply chain management and evaluate the opportunities and challenges of data analytics applications.
2	Determine	Determine the objective of data analytics in different scenarios and the data sources required to achieve that objective.
3	Apply	Apply methods and tools to collect and integrate data from different sources in the context of supply chain management.
4	Apply	Apply machine learning and statistical analytics methods and tools to uncover hidden patterns, correlations, trends, and knowledge that are useful for improving supply chain management processes.
5	Evaluate	Evaluate data analytics results in different scenarios and solve the problems that might occur throughout the entire data analytics process, from data collection to analysis.
6	Develop	Develop deployment architecture concepts by integrating existing tools/software.
7	Develop	Develop business model and ecosystem concepts.

Indicative Literature

- Sanders, N. (2014): Big data driven supply chain management: a framework for implementing analytics and turning information into intelligence, Pearson Education

Entry Requirements

Prerequisites	MDE-CO-08

	Python Programming for Data Engineers MSCM-MET-01 Programming in Python
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Data Analytics in Supply Chain Management	Project Report	2500 words	100	45%	1-7

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.16 Sustainable Cities and Transportation

Module Name	Sustainable Cities and Transportation
Module Code	MSCM-CO-08
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Prof. Dr.-Ing. Hendro Wicaksono

Study Semester		
Program	**Semester**	**Status**
DSSB-MSc Data Science for Society and Business	3	Mandatory Elective
MBA-120-MA MBA 120	3	Mandatory Elective
SCM-MSc Supply Chain Management	3	Mandatory Elective

Student Workload	
Lecture	35
Group Discussion	45
Independent Study	45
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Sustainable Cities and Transportation	MSCM-CO-08	Lecture	5

Module Description

In recent years, cities around the world have been initiating and developing ideas and projects that use the word “smart.” These projects and ideas are characterized by technologies, such as green energy, artificial intelligence, internet-of-things, and self-driving vehicles, that require large amounts of data. This module focuses on the main considerations of smart-city projects, including intelligent transportation (public transportation, urban logistics, smart vehicle) and environmental infrastructure (energy, water, and waste), and the technological backbone, such as the internet-of-things, cloud computing, and data analytics.

Usability and Relationship to other Modules

- Concepts in MDE-CO-01 Big Data Challenge will be applied. Academic writing skills in MSCM-CAR-01 facilitate the completion of tasks in this module.

- It serves as a mandatory elective module in the Society and Business Track for DSSB.

Intended Learning Outcomes

No	Competence	ILO
1	Identify	Identify typical scenarios of smart-city projects and evaluate the opportunities and challenges involved
2	Discover	Discover the backbone technologies required for intelligent transportation and environmental infrastructure and analyze the economics, ecological, and social impacts
3	Develop	Develop technological architecture concepts for typical smart-city scenarios
4	Work	Work with smart-city datasets and analyze the data needed to improve decision-making in smart-city contexts

Indicative Literature

- McClellan,S; Jimenez, J.A.; Koutitas, G.: Smart Cities Applications, Technologies, Standards, and Driving Factors, Springer, 2018.

Entry Requirements

Prerequisites	MDE-CO-01 Big Data Challenge
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Sustainable Cities and Transportation	Project Report	2500 words	100	45%	All

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.17 Applied Project Management

Module Name	Applied Project Management
Module Code	MSCM-CO-01
Module ECTS	5
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	3	Mandatory Elective

Student Workload	
Lecture	17.5
Seminar	17.5
Independent Study	90
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Applied Project Management	MSCM-CO-01	Lecture	5

Module Description

Managing supply chains requires the handling of numerous projects as to scope, time, resources, costs, quality and risks. This module addresses all project management issues holistically; dealing with risk management in detail. All of these areas include the transfer of specialist knowledge as well as soft skills.

Project Management contains the application of appropriate knowledge, processes, skills, tools and techniques to contribute to the success of temporary endeavors undertaken to create a unique product, service, or result. Project Management is of overwhelming relevance for global supply chains, esp. those which develop rapidly by innovative processes. In research and practice, project management is of increasing importance and it is correspondingly accepted to balance the competing project constraints of scope, quality, schedule, budget, resources and risk. On the individual level, project management knowledge can be considered a basic skill today. A special emphasis will be on risk management within projects. This comprises all coordinated activities that help understand, evaluate and take action on risks in order to minimize the effect of uncertainty on objectives. Complex projects face certain threats: natural disasters, terrorist attacks or the loss of important suppliers and service providers, all of which can disable projects for days or weeks. Thus, effective risk management can make the difference between success and failure of a project.

Recommended Knowledge

- Verbal and written communication skills

Intended Learning Outcomes

No	Competence	ILO
1	Apply	Apply important tools and methods of project management, quality management, risk management and suggest appropriate actions
2	Manage	Manage projects in the context of SCM efficiently and effectively.
3	Apply	Apply methods to assess and categorize risks based on their severity, likelihood of occurrence and likelihood of detection
4	Communicate	Communicate clearly with project team members throughout the project life cycle
5	Interact	Interact with stakeholders by continuously tracking and learning
6	Apply	Apply tools to relate customer requirements to technical specifications for products, thus ensuring high customer satisfaction
7	Evaluate	Evaluate critically quality problems based on data analysis (Pareto analysis, histograms, scatter diagrams, stratification).
8	Design	Design an appropriate supply chain risk management approach based on proactive and reactive strategies
9	Develop	Develop an overall philosophy for continuous improvement and total quality management
10	Take	Take responsibility for their own actions in project teams

Indicative Literature

- Project Management Institute (2021): A Guide to the Project Management Body of Knowledge (PMBOK® Guide). 7th edition.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Applied Project Management	Project Report	2500 word	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.18 Digital Transformation and Innovation

Module Name	Digital Transformation and Innovation
Module Code	MDSSB-DSAI-01
Module ECTS	5
Program Owner	DSSB-MSc (Data Science for Society and Business)
Module Coordinator	Prof. Dr. Christoph Lattemann

Study Semester		
Program	**Semester**	**Status**
MBA-60-MA MBA 60	1	Mandatory
DSSB-MSc Data Science for Society and Business	3	Mandatory
MBA-120-MA MBA 120	3	Mandatory
SCM-MSc Supply Chain Management	3	Mandatory Elective

Student Workload	
Seminar	35
Independent Study	90
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Digital Transformation of Organizations	MDSSB-DSAI-01-A	Seminar	2.5
Digital Services and Innovation	MDSSB-DSAI-01-B	Seminar	2.5

Module Description

The goal of this module is to help students learn, understand, and practice data-driven innovation for customers and change processes at an individual and organizational level. This module helps students understand real-life challenges in a complex and digitized world with multiple stakeholder interests. Further, students learn to develop and present innovative user-centered and theory-oriented solutions for real-world challenges in an IT-driven world. This module is home to two seminars of 7 weeks each. The first seminar investigates the digital transformations of organizations. It prepares students to understand and manage organizational change and transformation processes against a digitalization background. In particular, the following topics are discussed: organizational and algorithmic decision making, change and inertia, automation and reliability, and data-driven blind spots. The second seminar looks into digital innovation and their users. This seminar is strongly based on the paradigm of user-centeredness, user-centered design, and the ideas of the service dominant logic—a meta-

theoretical framework for explaining value co-creation through exchange among various configurations of actors.

Recommended Knowledge

- The module gives the opportunity to do an additional preparatory presentation during the class for personal feedback on one's own performance in front of an audience. This additional presentation is voluntary that can improve the grade by 0.33 points (German grading system), but is not necessary to reach the best grade in the module (1.0).

Usability and Relationship to other Modules

This module teaches the impact of digital technologies on organizational change. Insights can be used in all modules, particularly in the core and elective business and society modules, during the Capstone project and the internship.

Intended Learning Outcomes

No	Competence	ILO
1	Summarize	Summarize and classify the new data- and customer-driven technologies in a business context
2	Explain	Explain the economic and business rules in the information age
3	Explain	Explain the pros and cons of reliance on data and automation in organizations
4	Conduct	Conduct independent analyses of organizations,' markets,' and users' needs using scientific methods
5	Explain	Explain the service dominant logic (SDL) for business/entrepreneurial activities and the power of new technologies for customer relationship management
6	Improve	Improve their oral communication, along with individual and group presentation skills

Indicative Literature

- Book: McAfee, A., Brynjolfsson, E., Davenport, T. H., Patil, D. J., Barton, D. (2012). Big data: the management revolution
- Brown, T. (2008) Design Thinking, Harvard Business Review, 2-11
- Darrin, M.A., Devereux, W.S. (2017). The Agile Manifesto, design thinking and systems engineering. 2017 Annual IEEE International Systems Conference (SysCon)
- Lusch, R.F., Nambisan, S. (2015). Service Innovation: A Service-Dominant Logic Perspective. MIS Quarterly. Vol. 39 No.1 , pp. 155-175. https://doi.org/10.25300/MISQ/2015/39.1.07
- Marcinkowski, B., Gawin, B. (2021) Data-driven business model development – insights from the facility management industry. Journal of Facilities Management, Vol. 19 No. 2, pp. 129-149. https://doi.org/10.1108/JFM-08-2020-0051
- Vargo SL, Akaka MA, Vaughan CM. (2017). Conceptualizing Value: A Service-ecosystem View. Journal of Creating Value. 3(2):117-124. https://doi.org/10.1177%2F2394964317732861

- Vargo, S. L., Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. Journal of Marketing, 68(1): 1-17.
- Wang, S., Ding, W., Li , J., Yuan, Y., Ouyang, L., Wang, F.-Y (2019) Decentralized Autonomous Organizations: Concept, Model, And Applications Ieee Transactions On Computational Social Systems, Vol. 6, No. 5, October 2019
- Yang, X., Gebbing, P., Lankut, E., Lattemann, C. (2023) Virtual Creativity–Bibliometric Literature Review on Measurements and Factors That Influence Creative Virtual Teamwork, Creativity Research Journal, 1-15
- Zou, W., Lo, D., Singh, P., Feng, Y., Chen,Z., Xu, B. et. al. (2021) Smart Contract Development: Challenges and Opportunities, IEEE TRANSACTIONS ON SOFTWARE ENGINEERING, VOL. 47, NO. 10, OCTOBER 2021

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Digital Transformation of Organizations	Term Paper	3000 words	100	45%	All
Digital Services and Innovation					All

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.19 Artificial Intelligence in Business and Society

Module Name	Artificial Intelligence in Business and Society
Module Code	MDSSB-DSAI-02
Module ECTS	5
Program Owner	DSSB-MSc (Data Science for Society and Business)
Module Coordinator	Prof. Dr. Adalbert F.X. Wilhelm

Study Semester		
Program	**Semester**	**Status**
DSSB-MSc Data Science for Society and Business	3	Mandatory
SCM-MSc Supply Chain Management	3	Mandatory Elective

Student Workload	
Lecture/Laboratory	35
Independent Study	90
Total Hours	**125**

Module Components	**Number**	**Type**	**CP**
Artificial Intelligence in Business and Society	MDSSB-DSAI-02	Lecture and Laboratory	5

Module Description

AI is one of the current key words that instills hopes for reshaping economies by promising to generate productivity gains, improve efficiency, and contribute to better lives. At the same time, AI is also fueling anxieties and ethical concerns about codifying and reinforcing existing biases and infringing human rights, along with exacerbating inequality, climate change, market concentration, and the digital divide. This module will give a historical overview of AI's evolution, from the development of symbolic AI in the 1950s to the recent achievements in machine learning. It will introduce the basic AI principles and algorithms applied to common problems, including search, optimization, planning, and pattern recognition. The module will discuss the economic landscape of AI and its role as a new general-purpose technology that can lower the cost of prediction and enable better decisions, hence resulting in cost savings and enabling better resource allocation for a variety of applications, such as transport, agriculture, finance, marketing and advertising, science, health, criminal justice, security, the public sector, and augmented/virtual reality. The module will also review salient policy issues that accompany the diffusion of AI.

The objective of this module is to enhance students with the fundamental technical skills and knowledge to plan, design, develop, and evaluate AI applications from a business and a societal viewpoint. Upon successful completion of the module, students will not only have a profound knowledge on common techniques and areas of AI, including problem solving, knowledge

representation, reasoning, decision making, planning, perception and action, and learning, but will also be able to understand the implementation of the key components of intelligent agents with a moderate complexity.

Usability and Relationship to other Modules

This module uses insights from core and methods modules and can be applied to the Capstone project and the master thesis.

Recommended Knowledge

- Profound knowledge in R

- Harvard Business Review (2019) Artificial Intelligence. HBSP: Boston, MA.

Intended Learning Outcomes

No	Competence	ILO
1	Understand	Understand key terms and components in AI approaches
2	Explain	Explain key methods and techniques for automated decision making
3	Understand	Understand implementations of key components of AI systems
4	Evaluate	Evaluate the potentials and threats induced by AI systems
5	Appraise	Appraise AI application areas
6	Discuss	Discuss salient policy issues stirred by AI systems

Indicative Literature

- Agrawal, Gans, Goldfarb (2018) Prediction Machines. The Simple Economics of Artificial Intelligence. HBSP: Boston, MA.
- Cath, Wachter et al. (2017) Artificial Intelligence and the “Good Society”: The US, EU, and UK approach. Science and Engineering Ethics 24, 505-528.

Entry Requirements

Prerequisites	MDSSB-DSOC-02 Data Science Concepts MDSSB-MET-01 Data Science Tools in R and Python
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Artificial Intelligence in Business and Society	Project Report	3000 words	100	45%	All

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.20 Internship

Module Name	Internship
Module Code	MSCM-INT-01
Module ECTS	10
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Prof. Dr. Yilmaz Uygun

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	3	Mandatory Elective

Student Workload	
Internship	231
Project Work	19
Total Hours	**250**

Module Components	**Number**	**Type**	**CP**
Internship	MSCM-INT-01	Project	10

Module Description

Students can undertake an internship in a company or research organization to gain practical work experience and to start applying their knowledge into practice. A minimum of 231 working hours (i.e., 6 weeks of full-time occupation) is required for the successful completion of this module. To be professionally eligible, the content of the internship must be relevant to supply chain management. The tasks to be executed during the internship should be appropriate for a master's level student. The module coordinator and Career Service Center support students in finding suitable positions. The module coordinator also decides on the professional eligibility of the internship. It is recommended to submit an internship work program prior to starting the internship.

The internship provides training and experiential learning opportunities for supply chain management, logistics, and data analytics in a professional setting. It assists the students' development of employer-valued skills, such as teamwork, communication, steadiness, and attention to detail. It exposes students to the environment and performance expectations in the corporate world, may help prepare an application-oriented master thesis, and may make the entry into the professional job market easier.

Recommended Knowledge

Active preparation and training for working in a professional environment by training in German language and business etiquettes.

Usability and Relationship to other Modules

The internship replaces two mandatory electives of choice (5 CP each) and the replacements need to be discussed with and approved by the SPC. In order to count the internship towards graduation requirements, students must communicate the approval of the SPC along with the recommendation which elective module must be completed to Registrar Services.

Intended Learning Outcomes

No	Competence	ILO
1	Apply	Apply data science concepts and tools to real-world decision making .
2	Demonstrate	Demonstrate professional work attitude and business etiquettes.
3	Collaborate	Collaborate effectively in a professional environment.
4	Demonstrate	Demonstrate a solid work ethic and professional demeanor.
5	Demonstrate	Demonstrate commitment to ethical conduct and legal regulations.
6	Improve	Improve reporting skills.
7	Communicate	Communicate results to a non-expert audience.

Indicative Literature

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Internship	Project Report	2000 words	100	45%	All

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.21 Master Thesis

Module Name	Master Thesis
Module Code	MSCM-THE-01
Module ECTS	30
Program Owner	SCM-MSc (Supply Chain Management)
Module Coordinator	Dr. Georgi Dragolov

Study Semester		
Program	**Semester**	**Status**
SCM-MSc Supply Chain Management	4	Mandatory

Student Workload	
Independent Study	732.5
Group Discussion	17.5
Total Hours	**750**

Module Components	**Number**	**Type**	**CP**
Master Thesis	MSCM-THE-01	Thesis	30

Module Description

The Master Thesis course provides an opportunity for students to develop their interest in a specific subject area or specialization and to demonstrate their ability to undertake independent research. The thesis constitutes a scientific exposition featuring their own research results. Students are required to independently use and apply the knowledge, methods, skills, and competences acquired during their studies. Students are in regular contact with their thesis supervisor to ensure that the work progresses and meets the expectations and standards of an independent research work, and that it adheres to good scientific practice.

The selected topic of the thesis, as well as the approach must be related to a real supply chain management or logistics problem. The Study Program Chair has to approve the topic to ensure it is embedded in the program's overall topic, aims, and goals.

The thesis will be accompanied by a research colloquium where students have to present their thesis projects in an appropriate form (e.g., on posters) to fellow students as well as to the thesis supervisors to get feedback and further impulses. This presentation represents a module achievement in a group setting and will hence train in oral presentation skills.

Recommended Knowledge

- Proficiency in the area of the chosen thesis topic

- Identify an area or a topic of interest.

- Create a research proposal including a research plan to ensure timely submission.

- Ensure you possess all required technical research skills or are able to acquire them on time.

- Review again the University's Code of Academic Integrity and Guidelines to Ensure Good Academic Practice.

Usability and Relationship to other Modules

Depending on the topic, methods taught in MSCM-MET-02 Research Methods may be used; Academic writing skills taught in MSCM-CAR-01-A Communicating & Presenting (within the module MSCM-CAR-01) as well as project management concepts (especially time management) taught in MSCM-CO-01 will be applied.

Intended Learning Outcomes

No	Competence	ILO
1	Develop	Develop research questions independently guided by gaps in existing knowledge and determine appropriate research strategies and plans.
2	Choose	Choose and justify appropriate research methods independently for new, unsolved problems or issues.
3	Assess	Assess scientific results and literature critically.
4	Summarize	Summarize the current state of knowledge in their chosen specialization area
5	Apply	Apply appropriate knowledge, methods and competencies acquired during their studies independently.
6	Develop	Develop conclusions based on their own analysis
7	Use	Use individual feedback to develop and mature within the field of their specialization
8	Communicate	Communicate effectively their research results to and discuss them with various audiences.
9	Take	Take into consideration the social and ethical consequences of their activities

Indicative Literature

- Hammond, M. (2023): Writing a Postgraduate Thesis or Dissertation - Tools for Success. Routledge

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Master Thesis	Thesis	25000 words	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.22 Language Skills

The descriptions of the language modules are provided in a separate document, the "Language Module Handbook" that can be accessed from here: https://constructor.university/student-life/language-community-center/learning-languages.

7 Appendix

7.1 Intended Learning Outcomes Assessment-Matrix

MSc Supply Chain Management					Business Intelligence	Supply Chain Management and Logistics	Big Data Challenge	Trends & Challenges in SCM	Advanced Supply Chain Management	Purchasing & Distribution	Digital Transformation and Innovation	Data Analytics in Supply Chain Management	Applied Project Management	Sustainable Cities and Transportation	AI in Business & Society	Applied Modeling and Simulation	Supply Chain Engineering	Research Project	Programming in Python	Research Methods	Supply Chain Optimization	Communicating and Presenting	LanguageMa	Internship	Sustainable & Ethical Business in Germany	Master Thesis MSc SCM
Semester					1	1	1	2	2	2	3	3	3	3	3	1	2	3	1	2	3	1-2	1-2	2-3	3	4
Mandatory/ Mandatory elective					m	m	m	m	m	m	me	me	me	me	me	m	m	m	m	m	m	m	m	me	m	m
ECTS Credits					5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	10	5	30
	Competencies*																									
Program Learning Outcomes	**A**	**E**	**P**	**S**																						
critically evaluate and apply the most important theories and methods of supply chain management, supplier relations and value creation to real life situations, organizations and industries;	x					x		x	x	x	x	x	x	x	x	x	x	x		x	x			x	x	x
integrate new knowledge in complex supply chain contexts based on extensive data analytics;	x				x	x	x	x	x		x	x		x	x				x	x	x			x		x
assess opportunities and risks in global supply networks;	x	x				x	x	x			x	x	x		x						x			x		x
Make scientifically substantiated and data-driven decisions in the context of SCM and logistics and critically reflect possible impacts on business, environment and society;	x	x		x	x		x	x	x	x	x	x		x	x	x			x	x	x			x		x
independently investigate complex problems and develop new knowledge using both qualitative and quantitative methods;	x	x			x		x	x		x	x			x	x	x		x	x	x	x			x		x
apply interdisciplinary approaches to solve academic and professional problems;	x	x			x	x	x	x			x	x	x	x	x		x	x	x	x				x		x
efficiently and effectively manage supply chain related projects in multicultural and diverse environments;		x						x		x			x			x	x							x		
detect conflict potentials and solve interpersonal issues in large projects;		x	x	x				x					x											x	x	
communicate clearly and professionally with experts from different disciplines in a variety of forms and moderate in interdisciplinary interaction;	x	x					x	x	x	x			x			x	x	x				x	x	x	x	
manage multicultural and diverse environments and effectively participate in and lead mixed teams;		x						x		x						x	x					x		x	x	
use individual feedback on a continuous basis to develop and mature within their studies and beyond;			x					x										x				x		x	x	x
quickly become acquainted with their work and hence start their career more easily because of the integration of theory and practice during their education;		x	x					x	x	x							x					x	x	x	x	x
develop a professional self-perception based on goals and standards of professional actions in SCM;		x	x					x					x											x	x	
justify their professional actions with methodical knowledge und develop alternative approaches for issues they face in managing supply chains;	x	x	x	x				x	x	x			x			x	x	x			x	x		x	x	x
take responsibility for their own learning, personal development and role in society;			x	x					x	x			x					x				x	x	x	x	x
adhere to and defend ethical, scientific and professional standards.	x	x	x	x									x					x				x		x	x	x
Assessment Type																										
Oral examination																						x	x			
Written examination						x											x		x	x	x		x		x	
Essay																							x			
Term Paper										x	x											x			x	
Project assessment																										
Project report					x		x	x	x			x	x	x	x	x	x	x						x		
Laboratory Report																										
Poster presentation																										
Presentation																						x	x			
Thesis																										x

*Competencies: A-scientific/academic proficiency; E-competence for qualified employment; P-development of personality; S-competence for engagement in society

Figure 3: Intended Learning Outcomes Assessment Matrix