# COURSE CATALOG: FOOD ECONOMY AND PROCESS TECHNOLOGY

# CIVIL AND SUPPLY ENGINEERING + FOOD TECHNOLOGY

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International Commodity Trade in International Marketing				Module No.: LMT-S	Γ-11001
Course Length	Semester	Frequency of Course Offered		Credit Points (ECTS)	Weight of Grade
1 semester	1st semester	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		6 ECTS	same as credit points
Course Type		Contact Time	Self-Study	Total Workload	
Lecture 2 hours, Seminar 2 hours		4 contact hours / 60 hours	120 hours		
☐ Lectures ☐ Discussions ☐ Group Work ☐ Case studies				180 ř	nours
		Lear	ning Goals	'	
Learning outcomes and Competencies					

#### **Learning outcomes and Competencies**

## Practical knowledge and Skills

After successful completion of the module, students can/will:

- Understand theories, rules, and principles for marketing strategy management.
- Acquire comprehensive knowledge of marketing approaches, brand models and channel design.
- Analyze and evaluate corporate strategic problems from a target group and channel, as well as market and brand perspective.
- Based on a critical assessment of the findings, students arrive at adequate strategic marketing decisions.
- Develop problem-solving skills through marketing-strategy as well as brand- and channelrelated analysis and evaluation of solution options in the digital marketing context and deepen these in the simulation game.
- Use practical application of digital tools in the simulation game, and acquire and improve their solution-oriented skills.

# **Social Competence and Independence**

- The students achieve a deepening of their personal, social, and methodological competences through varying learning and working scenarios.
- They can practice the acquired knowledge individually, discuss and reflect on solution options together to simulate complex decision-making, action competence as well as leadership attitudes at a management level.

#### Content

A comprehensive scope of strategic marketing will be taught. The focus of this module is on entrepreneurial, brand, and market-related awareness and marketing as well as channel-relevant aspects that are necessary at management level in the decision-making and implementation of (digital) marketing measures in corporate practice.

The objective is to provide students with essential tools and skills for the independent conception of marketing plans as well as skills for complex decision-making and control processes. The students will act and think holistically in the entrepreneurial context as well as in terms of an efficient marketing strategy.

Applicability of Module (to Different Courses of Study)					
Course of Study 1	□ Required Subject	□ Compulsory Optional Subject			
	Recommended Prerequisite	s			
Basic knowledge of business management.					

Forms of	Requirement for Awarding of ECTS Points	
<ul> <li>□ written exam</li> <li>□ oral exam</li> <li>□ internship or laboratory performance</li> <li>□ colloquium</li> <li>⋈ project presentation</li> </ul>	<ul><li>□ portfolio</li><li>⋈ term paper or essay</li><li>□ practical exam</li></ul>	Term Paper (6.000 Words) 70%, Presentation 30%
Professo	Module Coordinator	
Prof. Dr. Patrick Siegfried Ph	Prof. Dr. Patrick Siegfried PhD/MBA	
Bibliography/ Recommended		Reading

Aaker, D. (2017): Strategic Market Management, 11th ed., Wiley.

Chapmann, C. / McDonnell Feit, E. (2019): R for Marketing Research and Analytics, Second Edition. Springer.

Kotler, P. / Keller, K. / Brady, M. / Goodman, M. / Hansen, T. (2019): Marketing Management, Fourth European Edition. Pearson.

Kumar, V. / Reinartz, W. (2019): Customer Relationship Management, Third Edition. Springer.

Palmatier, R. / Sridhar, S. (2021): Marketing Strategy – Based on First Principles and Data Analytics, Second Edition. Red Globe Press.

Siegfried, P. (2014): Knowledge Transfer in Service Research: Service Engineering in Startup Companies, Eul Publisher.

Process Management in Business Management/Start up Concepts			Module No.: LMT-S	Г-11002	
Duration	Semester	Frequency of Course Offered		Credit Points (ECTS)	Weight of Grade
1 semester	1st semester	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		3 ECTS	same as credit points
Course Type		Contact Time	Self-Study	Total Workload of Student(s)	
Lecture 2 hours		2 contact hours / 30 hours	60 hours		
☐ Lectures ☐ Discussior ☐ Group Wo ☐ Case stud	rk			90 hours	
Learning Goals (Learning Results)				ults)	

#### **Learning outcomes and Competencies**

## Practical knowledge and Skills

Upon successfully completing the module, students will be able to:

- Independently develop, design, and write their own business plan, as well as evaluate and assess business plans. They know what a business plan is, are familiar with its purpose, structure, its components, and the approach for drafting one.
- Understand why an entrepreneurial mindset is significant for the future viability of established companies.
- Explain the concept of corporate entrepreneurship and relate the determining factors of innovation: ability to implement, flexibility, agility, proactivity, and risk taking.
- Reflect and evaluate theoretical sustainability knowledge based on case studies.
- Apply circular business models to establish or foster sustainability in companies.
- Understand fundamental concepts of sustainability and corporate social responsibility, reflect them critically and apply them to practical problems.
- Independently analyze central problems in the development of business plans, the implementation of corporate entrepreneurship or the transformation or development of sustainable business models, by consulting literature and including current scientific findings, and provide solutions.
- Independently acquire additional knowledge.
- Present their assessments and opinions convincingly, and implement them creatively and actively in collaboration with experts and specialists from other fields.

## **Social Competence and Independence**

- The students achieve a deepening of their personal, social, and methodological competences through varying learning and working scenarios.
- They can practice the acquired knowledge individually, discuss and reflect on solution options together to simulate complex decision-making, action competence as well as leadership attitudes at a management level.

#### Content

The goal of the module is for students to develop a basic theoretical understanding of the entire entrepreneurship process, and in particular become acquainted with starting a company in the food industry. Furthermore, students will learn to use the instruments and tools for strategic management and will learn their application in an entrepreneurship context for the development of innovative business ideas, products, services, or entire business models.

Students will be acquainted with the individual core elements and components of a business plan and be able to independently draft as well as assess business plans. Furthermore, concepts of corporate entrepreneurship and intrapreneurship will be covered in detail. Finally, basic concepts and models of sustainability are discussed, and students are given a holistic, systemic perspective on the concept of sustainable entrepreneurship.

Course of Study 1	☐ Required Subject			
	Recommended Prerequis	ites		
Basic knowledge of business	management.			
Forms of	Assessment	Requirement for Awarding of ECTS Points		
<ul> <li>□ written exam</li> <li>□ oral exam</li> <li>□ internship or laboratory</li> <li>performance</li> <li>□ colloquium</li> <li>⋈ project presentation</li> </ul>	<ul><li>□ portfolio</li><li>☒ term paper or essay</li><li>□ practical exam</li></ul>	Term Paper (4.000 words) 70%, Presentation 30%		
Professor	Module Coordinator			
Prof. Dr. Patrick Siegfried Ph	Prof. Dr. Patrick Siegfried PhD/MBA			
	Bibliography/ Study Aids			

Applicability of Module (to Different Courses of Study)

Clegg, S.; Schweitzer, J.; Whittle, A.; Pitelis, C. (2017): Strategy: Theory and Practice. 2nd ed. London: Sage Publications.

Hisrich, R.; Peters, M.; Shepert, D. (2017): Entrepreneurship. 10th edition. New York: McGraw-Hill.

HBR (2018): HBR's 10 Must Reads on Entrepreneurship and Startups. Boston: Harvard Business Review Press.

Kotler, P. / Keller, K. / Brady, M. / Goodman, M. / Hansen, T. (2019): Marketing Management, Fourth European Edition. Pearson.

Kumar, V. / Reinartz, W. (2019): Customer Relationship Management, Third Edition. Springer.

Palmatier, R. / Sridhar, S. (2021): Marketing Strategy – Based on First Principles and Data Analytics, Second Edition. Red Globe Press.

Tidd, J.; Bessant, J. (2018): Managing innovation. Integrating technological market and organizational change. 6th ed. Hoboken: John Wiley & Sons.

Supply Chain Management				Module No.: LMT-S7	Γ-11003
Course Length	Semester	Frequency of Course Offered		Credit Points (ECTS)	Weight of Grade
1 semester	1st semester	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		3 ECTS	same as credit points
Course Type		Contact Time	Self-Study	Total Workload of Student(s)	
Lecture 2 hours		2 contact hours / 30 hours	60 hours		
☐ Lectures ☐ Discussions ☐ Group Work ☐ Case studies				90 h	ours
Learning Goals					

#### **Learning outcomes and Competencies**

## **Practical knowledge and Skills**

After successful completion of the module, students can:

- Realize the relevance and bottom-line impact of sourcing and supply chain management in a daily business environment.
- Select and apply the relevant management tools to achieve significant value creation by means of efficient operations processes.
- Define sourcing strategies and implement them sustainably, positioning the procurement and supply chain management department(s) as equal business partners.
- Demonstrate the ability to participate in management processes under real life conditions, and to analyze international business situations.
- Use the acquired skillset of international project managers either agile or traditional –to structure and organize projects and monitor their progress for an efficient and effective use of resources and customer satisfaction.

#### **Social Competence and Independence**

- The students achieve a deepening of their personal, social, and methodological competences through varying learning and working scenarios.
- They can practice the acquired knowledge individually, discuss and reflect on solution options together to simulate complex decision-making, action competence as well as leadership attitudes at a management level.

## Content

A customer-centered approach in supply chain management is a competitive advantage. Questions on the sustainability of a supply chain, the potential risks that might impact supply chain resilience as well as the appropriate degree of supply chain collaboration will therefore be key. To answer them, this course will cover the necessity of different supply chain designs, supply chain resilience as well as its performance measurements. In this context, supply chain risk management is an important focus. Students will discuss the effects of digitization across the supply chain in class and do research on additional relevant trends. To get a broader perspective on operations management, issues from process management as well as quality management will also be covered. Also, in the context of this course, case study work and the discussion of examples selected by the students will support the direct applicability of theoretical methods and concepts.

Applicability of Module (to Different Courses of Study)					
Course of Study 1	□ Required Subject	□ Compulsory Optional Subject			
	Recommended Prerequisi	tes			
Basic knowledge of business management.					

Forms of Assessment		Requirement for Awarding of ECTS Points
<ul> <li>□ written exam</li> <li>□ oral exam</li> <li>□ internship or laboratory</li> <li>performance</li> <li>□ colloquium</li> <li>⋈ project presentation</li> </ul>	<ul><li>□ portfolio</li><li>⋈ term paper or essay</li><li>□ practical exam</li></ul>	Term Paper (4.000 words) 70%, Presentation 30%
Professor	Module Coordinator	
Prof. Dr. Patrick Siegfried PhD/MBA		Prof. Dr. Patrick Siegfried PhD/MBA
Bibliography/ Recommended		reading

Bibliography/ Recommended reading

Bowersox, D; Closs, D., Cooper, M. B. (2020): Supply Chain Logistics Management, 5th ed. New York: McGraw-Hill Education.

Chapman. S.; Arnold, J. R. T.; Gatewood, A.; Clive. L. (2016): Introduction to Materials Management. 8th ed. Harlow: Pearson Education Limited.

Christopher, M. (2016): Logistics and Supply Chain Management. 5th ed. Harlow: Pearson Education Limited.

Gattorna, J. (2015): Dynamic Supply Chains: How to design, build and manage people-centric value networks. Harlow: Pearson Education Limited.

Heizer, J.; Render, B.; Munson, C. (2021): Principles of Operations Management: Sustainability and Supply Chain Management. Global 11th ed. Harlow: Pearson Education Limited.

Jacobs, F. R. / Chase, R. (2017): Operations and Supply Chain Management – Global Edition, 15th global ed., Mc Graw Hill Education, Maidenhead.

Lysons, K. Farrington, B. (2020): Procurement and Supply Chain Management. 10th ed. Harlow: Pearson Education Limited.

Rausch-Phan, M.T.; Siegfried, P. (2022): Sustainable Supply Chain Management, Springer Publisher.

Stock, J. R.; Manrodt, K. B. (2020): Supply Chain Management. New York: McGraw-Hill Education.

van Weele, A. J. (2018): Purchasing and Supply Chain Management, 7th ed., Cengage Learning, London.

Beverage Technology/Hygienic Design				Module No.: LMT-S	Г-11004
Duration	Semester, in which the Module Takes Place	Frequency of Course Offered		Credit Points (ECTS)	Weighting of the Grade
1 semester	1 semester (Master)	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		6 ECTS	same as credit points
Forms of teaching and learning		Contact Time	Self-Study	Total Workload of Student(s)	
<ul><li>Lecture</li><li>Seminar/laboratory practical</li></ul>		0.5 contact hours /7.5 hours	105 hours	180 h	nours
Learning Goals (Learning Results)					
The students Can describe the fundamental processes of beverage technologies from plant-based raw					

.... Can describe the fundamental processes of beverage technologies from plant-based raw materials (fruits/cereals) to alcoholic fermentation. They can derive suitable applications from the characteristics of raw materials and able to define quality orientated processes.

.... know the basic processing and preservation methods for beverages, assessment criteria for their applicability and can analyze them.

..... know the sanitation and industrial hygiene technologies for liquid food. They can identify necessary applications as required and describe, select, and assess necessary procedures.

#### Content

Technological basics of production and operation of non-alcoholic beverages (water, fruit juices, soft drinks from different raw materials)

Alcoholic fermentation, wine making, making of champagne, and brewing

Requirements of the processes regarding cleaning, hygienic design, and cleaning operations

# Applicability of Module (to Different Courses of Study)

Course of Study 1

Rec	uired	Sub	iect

□ Compulsory Optional

Subject

# Recommended Prerequisites

# Fundamentals of food technology

Forms of	Requirement for Awarding of ECTS Points	
<ul> <li>☑ written exam</li> <li>☐ oral exam</li> <li>☐ internship or laboratory</li> <li>performance</li> <li>☐ colloquium</li> <li>☒ project presentation</li> </ul>	<ul><li>□ portfolio</li><li>□ term paper or essay</li><li>□ practical exam</li></ul>	Passed presentation graded with at least 4.0
Professor	Module Coordinator	
Prof. DrIng. Jens Voigt	Prof. DrIng. Jens Voigt	
	ds	

# Recommended Literature:

- Sutherland, J.M., Varnam, A.:Beverages technology, chemistry and microbiology, Springer US, 978-1-4615-2508-0
- Mohammad Shafiur Rahman, Handbook of Food Preservation (2020) ISBN 9780429091483
- Tscheuschner, H.D. (Hrsg.), Voigt., J, et al.: Grundzüge der Lebensmitteltechnik, Kap. Getränkestellung, Reinigungstechnik, Betriebshygiene, 4. Auflage, 2017, ISBN 978-3-95468-412-0

Product Development/Product Design			Module No.: LMT-ST-11005			
Duration	Semester, in which the Module Takes Place	Frequency of Course Offered		Credit Points (ECTS)	Weighting of the Grade	
1 semester	1 semester (Master)	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		6 ECTS	same as credit points	
Forms of teaching and learning		Contact Time	Self-Study	Total Workload	otal Workload of Student(s)	
<ul><li>lecture</li><li>seminar</li><li>laboratory course</li><li>project</li></ul>		4 contact hours /60 hours	120 hours	180 hours		
		Learning Goal	s (Learning Re	sults)		
Assessment  Mark  Econ  Ecolo  considering t  Food  Nutri	of a product development of a product development of a product development of a product specifical and qualitate product-specification of the product of the	elopment consider tive requirements fic and technolog	Content ring: Sical bases of:	ations of product dev	elopment into a	
	levelopment task entation and dem	ks/project work: nonstration of proj	ject results			
		Applicab	ility of Module			
Course of S	tudy 1	□ Required	Subject		Optional	
		Recommen	ded Prerequisi	tes		
Fundamental	s of food technol	ogy, food law and	d food sensory	, nutritional physiolog	у	
Forms of Assessment		Requirement for Awarding of ECTS Points				
□ written exam □ oral exam □ internship performance □ colloquium	or laboratory	□ portfolio □ term paper or □ practical exam	essay	Passed Exam graded	with at least 4.0	

Literature referenced in the seminar, individually on the project tasks

Professor/ Instructor

□ project presentation

Prof. Dr.-Ing. Enrico Careglio

Bibliography/ Study Aids

Module Coordinator

Prof. Dr.-Ing. Enrico Careglio

Food Science in Everyday Life				Module No.: LMT-ST-11006				
Duration	Semester, in which the Module Takes Place	Frequency of Course Offered		Credit Points (ECTS)	Weighting of the Grade			
1 semester	1 semester (Master)	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		2 ECTS	same as credit points			
Forms of teaching and learning		Contact Time	Self-Study	Total Workload of Student(s)				
<ul><li>lecture</li><li>seminar</li><li>project</li></ul>		2 contact hours /30 hours	50 hours	80 hours				
		Learning Goals	s (Learning Re	esults)				
	parently ordinary used on engineer		ay-to-day nutr	ition, laws and princip	oles will be			
		C	Content					
Topics will be selected at the beginning of the course Possible subjects could be: - Food fraude - organic food - Food pairing - E-numbers								
		Applicab	ility of Module	!				
Course of Study 1		□ Required Subject		☑ Compulsory Optional Subject				
Recommended Prerequisites								
Fundamentals of food technology								
Forms of Assessment			Requirement for Awarding of ECTS Points					
<ul> <li>□ written exam</li> <li>□ oral exam</li> <li>□ internship or laboratory</li> <li>performance</li> <li>□ colloquium</li> <li>⋈ project presentation</li> </ul>		□ portfolio □ term paper or essay □ practical exam		Passed Exam graded with at least 4.0				
Professor/ Instructor			Module Coordinator					
Dr. Verena Eisner				Dr. Verena Eisner				
Bibliography/ Study Aids								

Literature referenced in the lecture, individually on the project tasks

Unit Operations in Food Processing				Module No.: LMT-ST-11007			
Duration	Semester, in which the Module Takes Place	Frequency of Course Offered		Credit Points (ECTS)	Weighting of the Grade		
1 semester	1 semester (Master)	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		6 ECTS	same as credit points		
Forms of teaching and learning		Contact Time	Self-Study	Total Workload	of Student(s)		
<ul><li>lecture</li><li>seminar</li><li>project</li></ul>		4 contact hours /60 hours	180 hours		ours		
		Learning Goals		•			
The students gain knowledge in selected unit operations, which are common used in Food industries. Essential principles are known, can be applied and students are able to transfer physical, chemical and (micro-) biological correlations to different applications.							
		C	Content				
Contents  Developing of principles in process engineering (law of conservation of mass and energy) Overview over the diversity and complexity of unit operations in food processing Selected food processes: e.g. crystallization, emulsification, filtration further applications as selected individual for presentations							
	Applicability of Module						
Course of Study 1   Required Subject		□ Compulsory Optional Subject					
Recommended Prerequisites							
Fundamentals of food technology							
Forms of Assessment				Requirement for Awarding of ECTS Points			
□ written ex □ oral exam □ internship performance □ colloquiun ⊠ project pr	m □ term paper or essay p or laboratory □ practical exam ce um		Passed Exam graded with at least 4.0				
Professor/ Instructor			Module Coor	Module Coordinator			
Dr. Verena Eisner			Dr. Verena Eisner				
Bibliography/ Study Aids							

Literature referenced in the lecture, individually on the project tasks

Biotechnology/Genetic Engineering				Module No.: LMT-ST-11008		
Duration	Semester, in which the Module Takes Place	Frequency of Course Offered		Credit Points (ECTS)	Weighting of the Grade	
1 semester	1 semester (Master)	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		6 ECTS	same as credit points	
Forms of teaching and learning		Contact Time	Self-Study	Total Workload of Student(s)		
<ul> <li>Lecture 2 contact hours</li> <li>Seminar 2 contact hours</li> </ul>		4 contact hours /60 hours	120 hours	180 hours		
			// D -	It - V		
		Learning Goals		esuits) bilities of strain improv		
recyclables-producing microorganisms. They will understand and analyze industrial production with microorganisms and the basic process of product production. They will understand and analyze gene technology working methods and the construction of genetically modified organisms, in particular genetically modified microorganisms and plants and their use in the food and pharmaceutical sectors.  Content  - Screening procedures - Industrial production strains - Bioreactors, production by fermentation - Processing, technical use of enzymes						
<ul> <li>Basic and up-to-date genetic engineering methods and tools</li> <li>Production and use of genetically modified organisms</li> </ul>						
Applicability of Module						
Course of Study 1		□ Required S	Subject		Optional	
Recommended Prerequisites						
Biological and microbiological knowledge (Bachelor level), knowledge of process engineering						
Forms of Assessment				Requirement for Awarding of ECTS Points		
<ul> <li>⋈ written ex</li> <li>□ oral exam</li> <li>□ internship</li> <li>performance</li> <li>□ colloquium</li> <li>⋈ project pre</li> </ul>	or laboratory	□ portfolio □ term paper or □ practical exam	essay	Passed exam graded v	with at least 4.0	

Recommended reading:

RENNEBERG, R. et al.: Biotechnologie für Einsteiger (ISBN 978-3-662-56283-3)

CHMIEL, H. et al. (Ed.): Bioprozesstechnik (ISBN 978-3-662-54041-1) KEMPKEN, F.: Gentechnik bei Pflanzen (ISBN 978-3-662-60743-5) KURRECK, J. et al. (Ed.): Bioanalytik (ISBN 978-3-662-61706-9)

Professor/ Instructor

Prof. Dr. rer. nat. Beatrix Konermann

Bibliography/ Study Aids

Module Coordinator
Prof. Dr. rer. nat. Beatrix Konermann

New Technologies in Food Engineering				Module No.: LMT-ST-11009		
Duration	Semester, in which the Module Takes Place	Frequency of Course Offered		Credit Points (ECTS)	Weighting of the Grade	
1 semester	1 semester (Master)	<ul><li>☑ each summer semester</li><li>☐ each winter semester</li><li>☐ when needed</li></ul>		3 ECTS	same as credit points	
	teaching and arning	Contact Time Self-Study		Total Workload of Student(s)		
• seminar		0.5 contact hours /7.5 hours	82.5 hours	90 hours		
		Learning Goals	s (Learning Re	sults)		
	lent processing o	f information fron ods and can analy		olications on novel treater	atment,	
Content						
Selected topics of novel treatment and analysis methods e.g. Ionizing Irradiation, High Pressure Treatment, Plasma Treatment, Pulsed Electric Fields, Tomography, Numerical Modeling, Infrared, Microwave, Radio Wave and Ohmic Heating						
		Applicab	ility of Module			
Course of Study 1		☐ Required S	I Subject ⊠ Compulsory Optiona Subject		Optional	
Recommended Prerequisites						
Fundamentals of food technology;						
Forms of Assessment			Requirement for Awarding of ECTS Points			
		Passed presentation g least 4.0	assed presentation graded with at ast 4.0			
Professor/ Instructor				Module Coordinator		
Prof. DrIng. Marc Regie		r F		Prof. DrIng. Marc Regier		
Bibliography/ Study Aids						

# Recommended reading:

Richardson, P.: Thermal technologies in food processing, (ISBN 9781855735583). Ortega-Rivas, E.: Processing Effects on Safety and Quality of Foods (ISBN 1420061127) plus individual literature on the project tasks.