



UNIVERSITÄT
BAYREUTH



Master's Programme

Food System Sciences

Module Handbook

Status: 14 November 2023

Study Plan “Food System Sciences” (M.Sc.)

The study plan serves as an overview of the various modules that you have to take in the course of the study programme. The sequence of the modules is a recommendation, and the semester offer may deviate from it. The current semester offer can be found in the timetables.

A – Inter-/transdisciplinary Competences	Analytics in life sciences - from molecules to cells – 6 ECTS	Nutritional physiology – from cells to organism – 6 ECTS	Food Law – from National to International Perspectives – 6 ECTS	Bioeconomy – sustainable production, business, and society – 6 ECTS	Study Skills, Science Communication, and Research Seminar – 6 ECTS
B - Specialisation - Electives*	Advanced Analytics and Food Quality - 5 ECTS	Advanced human physiology - 5 ECTS	Advanced Institutional and Substantive EU Food Law - 5 ECTS	Advanced Business Analytics - 5 ECTS	
	Advanced nutritional biochemistry and physiology - 5 ECTS		Advanced Institutional and Substantive International Food Law - 5 ECTS	Advanced Theories in Food Studies - 5 ECTS	
	Advanced microbiology – food microbiology - 5 ECTS		Seminar Entrepreneurship and Innovation - 5 ECTS		
	Advanced Genetics and Epigenetics - 5 ECTS				
	Advanced Cell-Environment Interactions - 5 ECTS		Advanced food policy - 5 ECTS		
		Advanced Plant Breeding and Sustainable Food Production - 5 ECTS		Advanced Plant Breeding and Sustainable Food Production - 5 ECTS	
C - Specialisation**	Current Issues in Analytical Sciences 5 ECTS	Current issues in nutritional biochemistry and immunology - 5 ECTS	Current Issues in European and international food trade economic(s) law - 5 ECTS	Current issues in business analytics - 5 ECTS	
	Current issues in biochemistry and biotechnology of microorganisms - 5 ECTS	Current issues in human nutrition in health and disease - 5 ECTS	Current Issues in European and international environmental law - 5 ECTS	Current issues in food studies - 5 ECTS	
	Current Issues in Cellular Responses to External Cues - 5 ECTS	Current Issues in Cellular, Organismal, and Exercise Physiology/Biology - 5 ECTS	Current Issues in Food and Health Policy - 5 ECTS	Current Issues in Sustainability and Production of Plant-based Foods - 5 ECTS	
D – Professional competences across specialisations	(Research) Internship - 12 ECTS				Research Seminar Food System Sciences - 3 ECTS
E - Master's Thesis	Master's Thesis - 30 ECTS				

If there are any prerequisites for participation expected, you will find this in the descriptions of the individual modules.

Module Handbook „Food System Sciences“ (M.Sc.)

*In module area B – Specialisation – Electives – you must pass a total of 30 ECTS points; at least 15 ECTS points must be credits towards one of the specialisations listed in module area C. The other 15 ECTS points in module area B can be credits towards any of the other specialisations. It is recommended that you pass 15 ECTS points towards the specialisation with which you continue in module area C. Please note that, if this is not given, module area C might be very challenging.

**In module area C – Specialisation – you must pass a total of 15 ECTS points within one specialisation.

Please note that all 5 modules in module area A are compulsory irrespective of your final specialisation.

Colour code:

Specialisation Analytics in Life Sciences – from Molecules to Cells	Specialisation Nutritional Physiology – from Cells to Organisms	Specialisation Food Law – from National to International Perspectives	Specialisation Bioeconomy – Sustainable Production, Business, and Society	Professional competences across specialisations
---	--	--	--	--

Content

A – Inter-/transdisciplinary Competences.....	6
Analytics in Life Sciences - from Molecules to Cells.....	6
Nutritional Physiology – from Cells to Organism	7
Food Law – from National to International Perspectives	8
Bioeconomy – Sustainable Production, Business, and Society	9
Study Skills, Science Communication, and Research Seminar	10
B – Specialisation - Electives.....	11
Advanced Analytics and Food Quality.....	11
Advanced Nutritional Biochemistry and Physiology	12
Advanced Microbiology – Food Microbiology.....	13
Advanced Human Physiology	14
Advanced Cell-Environment Interactions.....	15
Advanced Genetics and Epigenetics.....	16
Advanced Plant Breeding and Sustainable Food Production	17
Seminar Entrepreneurship & Innovation	18
Advanced Institutional and Substantive EU Food Law.....	19
Advanced Institutional and Substantive International Food Law	21
Advanced Food Policy	23
Advanced Business Analytics.....	24
Advanced Theories in Food Studies	25
C - Specialisation.....	26
Current Issues in Analytical Sciences.....	26
Current Issues in Biochemistry and Biotechnology of Microorganisms.....	27
Current Issues in Cellular Responses to External Cues.....	28
Current Issues in Nutritional Biochemistry and Immunology	29
Current Issues in Human Nutrition in Health and Disease.....	30
Current Issues in Cellular, Organismal, and Exercise Physiology/Biology.....	31
Current Issues in Food and Health Policy.....	32
Current Issues in European and International Food Trade Economic(s) Law	33
Current Issues in European and International Environmental Law	34
Current Issues in Business Analytics.....	35
Current Issues in Food Studies	36
Current Issues in Sustainability and Production of Plant-based Foods.....	37
D – Professional competences across specialisations.....	38

Module Handbook „Food System Sciences“ (M.Sc.)

Research Seminar Food System Sciences..... 38
(Research) Internship 39
E – Master’s Thesis 40
 Master’s Thesis..... 40
Explanatory Notes 41

Module Area	A – Inter-/transdisciplinary Competences
Module Title	Analytics in Life Sciences - from Molecules to Cells
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Susanne Baldermann Prof. Dr. A.C. (Corina) Vlot-Schuster
Language	English
Learning outcomes	The students acquire knowledge on how cells function based on selected examples. Molecular interactions between the different components – from single molecules to multiple organelles – will be discussed. Additionally, students will deepen their knowledge about food composition and determine changes induced during storage or chemical interactions. Using traditional analytical and biology techniques, students will look at individual classes of molecules and characterize specific targets in organelles and apply this knowledge to improve the nutritional quality of (plant-based) food.
Content	The lecture will cover: <ul style="list-style-type: none"> - The cellular mechanism and regulation of the formation of nutritionally relevant molecules - Advanced knowledge about food composition - Changes induced by storage and chemical interactions The practical work will cover: <ul style="list-style-type: none"> - Methods for the determination of specific molecular targets - Advanced methods for the determination of nutritionally relevant molecules and signalling molecules
Teaching Formats	lecture (2 hours per week) practical work in the lab (3 hours per week)
Requirements for Participation	
Usability of the Module	open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	written examination (50%), semester-long assignments (50%)
ECTS Points	6
Frequency	Winter semester (recommendation: 1st semester)
Workload	Lectures and practical work in the lab: 75 h Self-study (incl. assessment) 105 h Total: 180 h
Duration	1 Semester

Module Area	A – Inter-/transdisciplinary Competences
Module Title	Nutritional Physiology – from Cells to Organism
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Frank Suhr
Language	English
Learning outcomes	After completing this module, the students will be able to (i) delve into the intricate relationship between nutrition and physiology and (ii) explore how nutrients impact the functioning of cells, tissues, and the entire organism. Through interdisciplinary approaches, the students will gain a comprehensive understanding of nutritional biochemistry, metabolism, and physiology with emphasis on latest research to create a solid foundation for a career in nutrition, health sciences or related fields.
Content	<p>The lecture will cover:</p> <ul style="list-style-type: none"> - Cellular nutrition - Tissue- and organ-level physiology - Nutritional biochemistry - Nutritional genetics - Nutritional epigenetics <p>The practical work will include:</p> <ul style="list-style-type: none"> - Enzyme assays, spectrophotometry, pH measurement - ATP generation in cells
Teaching Formats	Lecture (2 hours per week) Practical work in the lab (3 hours per week)
Requirements for Participation	
Usability of the Module	open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Written examination (50%), semester-long assignments (50%)
ECTS Points	6
Frequency	Winter semester (recommendation: 1st semester)
Workload	<p>Lectures and practical work in the lab: 75 h</p> <p>Self-study (incl. assessment) 105 h</p> <p>Total: 180 h</p>
Duration	1 Semester

Module Area	A – Inter-/transdisciplinary Competences							
Module Title	Food Law – from National to International Perspectives							
Module Number								
Course Number								
Module Coordinator	Prof. Dr. Kai Purnhagen							
Language	English							
Learning outcomes	<p>The students acquire detailed and differentiated knowledge</p> <ul style="list-style-type: none"> - to trace the historical development and evolution of the area of food law and its transformation to an integrated regime of international and national perspectives - to identify and interpret key statutes and provisions and the underlying principles governing food safety, quality and trade at national, EU and international levels - to recognize and analyse the relationship between national food laws and policies and European and international law - to understand “law in action” by analysing landmark food law cases and disputes as well as current developments and challenges - to develop basic legal thinking skills <p>Based on this knowledge, students are equipped with a basic understanding of the legal architecture governing food systems</p>							
Content	<p>The course offers a comprehensive overview of food law. It introduces students with its definition and scope and its nexus to public health, economic considerations, and global trade. Emphasis is placed on the evolving interplay between national and international regulations. The course introduces basic structures of European, international, and national institutions as well substantive rules governing food law.</p>							
Teaching Formats	lecture (2 hours per week); tutorial (2 hours per week)							
Requirements for Participation								
Usability of the Module	open for students of the following study programmes: M.Sc. Food System Sciences							
Requirements for the Award of ECTS Points	written examination (100%)							
ECTS points	6							
Frequency	Winter semester (recommendation: 1st semester)							
Workload	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Lectures and seminars:</td> <td style="text-align: right;">60 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td style="text-align: right;">120 h</td> </tr> <tr> <td>Total:</td> <td style="text-align: right;">180 h</td> </tr> </table>		Lectures and seminars:	60 h	Self-study (incl. assessment)	120 h	Total:	180 h
Lectures and seminars:	60 h							
Self-study (incl. assessment)	120 h							
Total:	180 h							
Duration	1 semester							

Module Area	A – Inter-/transdisciplinary Competences	
Module Title	Bioeconomy – Sustainable Production, Business, and Society	
Module Number		
Course Number		
Module Coordinator	Prof. Dr. Christian Fikar	
Language	English	
Learning outcomes	After completion of the course, students have a basic knowledge on key concepts and challenges of the bioeconomy. A special focus is set on food systems and related processes. Consequently, students will be able to tackle key ideas on how to strengthen the connection between production, business, and society for a more sustainable future.	
Content	<p>The course tackles:</p> <ul style="list-style-type: none"> - Introduction to Bioeconomy - Plant-Based Bioeconomy - Livestock-based Bioeconomy - Sustainable Production - Business Transformation - Circular Economy - Digital and Societal Transformations - Corporate Social Responsibility 	
Teaching Formats	Lecture (2 hours per week) Seminar (2 hours per week)	
Requirements for Participation		
Usability of the Module	open for students of the following study programmes: M.Sc. Food System Sciences	
Requirements for the Award of ECTS Points	written examination (100%)	
ECTS Points	6	
Frequency	Winter semester (recommendation: 1st semester)	
Workload	Lectures and seminars:	60 h
	Self-study (incl. assessment)	120 h
	Total:	180 h
Duration	1 Semester	

Module Area	A – Inter-/transdisciplinary Competences	
Module Title	Study Skills, Science Communication, and Research Seminar	
Module Number		
Course Number		
Module Coordinator	Prof. Dr. A.C. (Corina) Vlot-Schuster	
Language	English	
Learning outcomes	After completion of the course, students can select and apply effective study methods and are aware of the practical foundations of communicating science to lay and (semi-)expert audiences and stakeholders using a variety of media. Further, students will know about key scientific concepts in the field of Food System Sciences. Using this knowledge, students will be able to write texts and design visualisations that are tailored to medium, content, and audience.	
Content	<p>The course tackles:</p> <ul style="list-style-type: none"> - Introduction to scientific working - Introduction to literature search engines - Introduction to science communication - Tailored communication - Writing for lay and expert audiences - Designing visualisations for lay and expert audiences <p>The course includes practical applications of the above and a weekly rotation of scientific presentations by local and invited (guest) professors from research fields across the four specialisations in the M.Sc. programme Food System Sciences.</p>	
Teaching Formats	Seminar (4 hours per week)	
Requirements for Participation		
Usability of the Module	open for students of the following study programmes: M. Sc. Food System Sciences	
Requirements for the Award of ECTS Points	Semester-long assignments (100%)	
ECTS Points	6	
Frequency	Winter semester (recommendation: 1st semester)	
Workload	Seminars:	60 h
	Self-study (incl. assessment)	120 h
	Total:	180 h
Duration	1 Semester	

Module Area	B – Specialisation - Electives						
Module Title	Advanced Analytics and Food Quality						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. Susanne Baldermann						
Language	English						
Learning outcomes	The students will gain knowledge about state-of-the-art analytical technologies including mass spectrometry and the validation of methods and apply this knowledge in the practical lab course.						
Content	The course will cover: <ul style="list-style-type: none"> - Advanced knowledge in chromatography - Introduction into mass spectrometry - Validation of analytical methods 						
Teaching Formats	Lecture (1 hour per week) Practical work in the lab (4 hours per week)						
Requirements for Participation							
Usability of the Module	Credits towards continuation with Specialisation 1 - Analytics in Life Sciences - in Module area C; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Written or oral examination (40%), semester-long assignments (60%)						
ECTS Points	5						
Frequency	Summer semester (recommendation: 2 nd semester)						
Workload	<table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">Lectures, Lab course:</td> <td style="text-align: right;">75 h</td> </tr> <tr> <td style="padding-left: 20px;">Self-study (incl. assessment)</td> <td style="text-align: right;">75 h</td> </tr> <tr> <td style="padding-left: 20px;">Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>	Lectures, Lab course:	75 h	Self-study (incl. assessment)	75 h	Total:	150 h
Lectures, Lab course:	75 h						
Self-study (incl. assessment)	75 h						
Total:	150 h						
Duration	1 semester						

Module Area	B – Specialisation - Electives
Module Title	Advanced Nutritional Biochemistry and Physiology
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Christian Riedel
Language	English
Learning outcomes	The students acquire basic and specific knowledge in the control and regulation of energy and intermediary metabolism. They are able to describe the specific function of micronutrients in the human body and understand the mechanisms of aging. Based on this knowledge, they are able to explain specific pathological outcomes and disease development in the context of human nutrition.
Content	Lecture and seminar topics will include: <ul style="list-style-type: none"> - Hormonal control and impact of nutrition: acute regulation of metabolism, hormonal regulatory circuits, local mediators - Impact of micronutrients in health and disease - Energy metabolism and interplay of organs - Advanced liver metabolism and organ crosstalk - Regulation and control of aging - Patho-biochemistry and patho-physiology: nutrition-related diseases Practical lab course with biochemical, molecular biological and physiological methods
Teaching Formats	Lecture (2 hours per week) Seminar and practical work in the lab (3 hours per week)
Requirements for Participation	Prior attendance of the module ‘Nutritional physiology– from cells to organisms’ is recommended
Usability of the Module	Credits towards continuation with Specialisations 1 - Analytics in Life Sciences – and 2- Nutritional Physiology - in Module area C; open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Written examination (60%), semester-long assignments (40%)
ECTS Points	5
Frequency	Summer semester (recommendation: 2nd semester)
Workload	Lectures, seminar, and practical work in the lab: 75 h Self-study (incl. assessment) 75 h Total: 150 h
Duration	1 semester

Module Area	B – Specialisation - Electives						
Module Title	Advanced Microbiology – Food Microbiology						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. Gerald Lackner						
Language	English						
Learning outcomes	In this module, students will learn about the significant role of microbes in food production and safety. The course will also shed light on the profound impact of the microbiota on human health and nutrition. Through practical and theoretical instruction, participants will gain the ability to comprehend microbial processes in food production and hygiene measures critical in food processing.						
Content	<p>Lecture:</p> <ul style="list-style-type: none"> - Microbial physiology - Food spoilage - Foodborne illness - Food preservation / hygiene - Microorganisms in food production - Fermented and novel foods - Microbiome in health and nutrition (e.g., probiotics and prebiotic) <p>Practical course:</p> <ul style="list-style-type: none"> - Microbiological examination techniques - Detection of microorganisms in food - Control of microbial growth (e.g., disinfection, antibiotics) - Fermentation (e.g., yogurt production) 						
Teaching Formats	Lecture (2 hours per week) Laboratory course (3 hours per week)						
Requirements for Participation	Basic knowledge of biology and chemistry Basic practical experience in biology lab courses						
Usability of the Module	Credits towards continuation with Specialisations 1 - Analytics in Life Sciences – and 2- Nutritional Physiology - in Module area C; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Written / oral examination (60%), semester-long assignments (40%)						
ECTS Points	5						
Frequency	Summer semester (recommendation: 2 nd semester)						
Workload	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-right: 20px;">Lectures and practical lab work:</td> <td style="text-align: right;">75 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td style="text-align: right;">75 h</td> </tr> <tr> <td>Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>	Lectures and practical lab work:	75 h	Self-study (incl. assessment)	75 h	Total:	150 h
Lectures and practical lab work:	75 h						
Self-study (incl. assessment)	75 h						
Total:	150 h						
Duration	1 semester						

Module Area	B – Specialisation - Electives
Module Title	Advanced Human Physiology
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Frank Suhr
Language	English
Learning outcomes	The student can delve deeply into the intricacies of molecular human physiology, offering an in-depth exploration of the physiological mechanisms governing human health and aging. The focus will be on cutting-edge research concepts to develop a comprehensive understanding of human physiology and multiple levels to prepare students for careers in research, healthcare, and related fields.
Content	<p>The lecture will cover:</p> <ul style="list-style-type: none"> - Concepts of molecular and cellular human physiology - Advanced physiology of multiple organ systems - Cellular and molecular mechanisms of aging - Cellular and molecular mechanisms of disease development <p>The practical work will cover:</p> <ul style="list-style-type: none"> - Cellular, molecular, and biochemical methods
Teaching Formats	Lecture (2 hours per week) Seminar and practical work in the lab (3 hours per week)
Requirements for Participation	Prior attendance of the module ‘Nutritional physiology– from cells to organisms’ is recommended
Usability of the Module	Credits towards continuation with Specialisation 2 – Nutritional Physiology - in module area C Open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Written examination (60%), semester-long assignments (40%)
ECTS Points	5
Frequency	Summer semester (recommendation: 2 nd semester)
Workload	<p>Lectures, seminar, and practical work in the lab: 75 h</p> <p>Self-study (incl. assessment) 75 h</p> <p>Total: 150 h</p>
Duration	1 Semester

Module Area	B – Specialisation - Electives
Module Title	Advanced Cell-Environment Interactions
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Dr. Ada Cavalvanti-Adams
Language	English
Learning outcomes	The students can delve into the intricacies of cell—environment interactions, offering an in-depth exploration of cellular mechanisms that allow the cell to communication with its environment and vice versa. The focus will be on cutting-edge research concepts to develop a comprehensive understanding of cell—environment interplay, which is fundamental to understand organismal health.
Content	<p>The lecture will cover:</p> <ul style="list-style-type: none"> - Concepts of cell—environment interactions - Cell signaling pathways - Tissue engineering and biomaterials - Tissue microenvironment - Biotechnology and synthetic biology <p>The practical work will cover:</p> <ul style="list-style-type: none"> - Cellular, molecular, and biochemical methods
Teaching Formats	<p>Lecture (2 hours per week) Seminar and practical work in the lab (3 hours per week)</p>
Requirements for Participation	Prior attendance of the modules ‘Analytics in Life Sciences - from Molecules to Cells’ and ‘Nutritional physiology– from cells to organisms’ is recommended
Usability of the Module	Credits towards continuation with Specialisations 1 - Analytics in Life Sciences – and 2- Nutritional Physiology - in Module area C; open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Written examination (60%), semester-long assignments (40%)
ECTS Points	5
Frequency	Summer semester (recommendation: 2 nd semester)
Workload	<p>Lectures, seminar, and practical work in the lab: 75 h Self-study (incl. assessment) 75 h Total: 150 h</p>
Duration	1 Semester

Module Area	B – Specialisation - Electives
Module Title	Advanced Genetics and Epigenetics
Module Number	
Course Number	
Module Coordinator	Prof. Dr. A.C. (Corina) Vlot-Schuster
Language	English
Learning outcomes	The students will develop an understanding of the intricate mechanisms of the regulation of cellular gene expression to regulate metabolism at the organism level in response to environmental cues. Further, students will understand epigenetic mechanisms that contribute to the regulation of gene expression and homeostasis and will learn approaches to study genetic and epigenetic aspects to organism-environment interactions and the prevention/development of (nutrition-associated) diseases.
Content	<p>The lecture will cover:</p> <ul style="list-style-type: none"> - Genetics of organism – environment Interactions - Basic principles of epigenetic gene regulation - Influence of epigenetics on organism-environment interactions - Influence of epigenetics on prevention/onset of (nutrition-associated) disease <p>The seminar will include:</p> <ul style="list-style-type: none"> - Literature studies of the state-of-the-art of epigenetics research in plant and human health and disease
Teaching Formats	Lecture (2 hours per week) Seminar (2 hours per week)
Requirements for Participation	Prior attendance of the module ‘Analytics in Life Sciences - from Molecules to Cells’ is recommended.
Usability of the Module	Credits towards continuation with Specialisations 1 - Analytics in Life Sciences – and 2- Nutritional Physiology - in Module area C; open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Written examination (60%), semester-long assignments (40%)
ECTS Points	5
Frequency	Summer semester (recommendation: 2 nd semester)
Workload	<p>Lectures, seminar, and practical</p> <p>work in the lab: 60 h</p> <p>Self-study (incl. assessment) 90 h</p> <p>Total: 150 h</p>
Duration	1 Semester

Module Area	B – Specialisation - Electives	
Module Title	Advanced Plant Breeding and Sustainable Food Production	
Module Number		
Course Number		
Module Coordinator	Professor Dr. A.C. (Corina) Vlot-Schuster	
Language	English	
Learning outcomes	The students acquire detailed and differentiated knowledge about plant breeding and its relevance to produce food. Furthermore, they know about CRISPR-Cas genome editing. Based on this knowledge, they can identify and optimize strategies to support the production of healthy food in the face of climate change.	
Content	<p>Lecture content will apply the principles of Mendel’s genetics to analyse conventional and modern plant breeding methods. Further, repercussions of climate change will be discussed, focusing on both the quantity and quality of yield.</p> <p>In the seminar students will work in groups to design plant breeding schemes; research foci will include plant stress tolerance in the face of climate change as well as the accumulation of plant secondary metabolites to optimize the health benefits (i.e. quality) of plant-based foods.</p>	
Teaching Formats	Lecture (2 hours per week) Seminar (2 hours per week)	
Requirements for Participation	Basic knowledge of genetics Prior completion of the module Analytics in Life Sciences – from molecules to cells, is recommended	
Usability of the Module	Credits towards continuation with Specialisations 2 - Nutritional Physiology - and 4 - Bioeconomy – in Module area C; open for students of the following study programmes: M.Sc. Food System Sciences	
Requirements for the Award of ECTS Points	Oral/ written examination (60%), Essay/ Presentation (40%)	
ECTS Points	5	
Frequency	Summer semester (recommendation: 2nd semester)	
Workload	Lectures and seminars:	60 h
	Self-study (incl. assessment)	90 h
	Total:	150 h
Duration	1 semester	

Module Area	B – Specialisation - Electives							
Module Title	Seminar Entrepreneurship & Innovation							
Module Number								
Course Number								
Module Coordinator	Prof. Dr. Rebecca Preller							
Language	English							
Learning outcomes	<p>At the end of the seminar the students will be able to:</p> <ul style="list-style-type: none"> - understand the difference between idea, business opportunities, invention, and innovation; - evaluate opportunities for business ideas and apply business concepts by prototyping,; - evaluate business ideas and identify business opportunities; - segment and analyse markets; - evaluate own business idea with the help of customer feedback, observations from stakeholders, and interviews; - identify a real customer problem and create customer benefit with ideas for a solution. - understand effectual entrepreneurship; - understand basic economic terms, such as Intellectual Property, Cashflow, Venture Capital, Controlling; - understand Design Thinking methodology 							
Content	<p>In a creative atmosphere, students learn to develop and present a business idea to solve a customer problem. For that purpose, a startup pitch is developed. During the course following topics are discussed.</p> <ul style="list-style-type: none"> - Fundamentals of innovation - Business model - Consumer and consumer value - Assessment of business ideas - Market & competition - Pitching business ideas - Presentation practice: customer, customer value, market USP - Forming powerful business teams - Fundamentals on protection of intellectual property 							
Teaching Formats	The seminar will be offered in a blocked format to facilitate project-oriented learning and teamwork.							
Requirements for Participation	none							
Usability of the Module	Credits towards continuation with Specialisations 3 – Food Law - and 4 - Bioeconomy – in Module area C; open for students of the following study programmes: M.Sc. Food System Sciences							
Requirements for the Award of ECTS Points	Presentation (100%)/Presentation (50%), semester-long assignments (50%)							
ECTS Points	5							
Frequency	Summer semester (recommendation: 2 nd semester)							
Workload	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Seminars:</td> <td style="text-align: right;">60 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td style="text-align: right;">90h</td> </tr> <tr> <td>Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>		Seminars:	60 h	Self-study (incl. assessment)	90h	Total:	150 h
Seminars:	60 h							
Self-study (incl. assessment)	90h							
Total:	150 h							

Duration	1 semester
Module Area	B – Specialisation - Electives
Module Title	Advanced Institutional and Substantive EU Food Law
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Nils Grosche
Language	English
Learning outcomes	<p>The students acquire detailed and differentiated knowledge</p> <ul style="list-style-type: none"> - to demonstrate an in-depth understanding of the European institutional framework governing food law by distinguishing functions of different institutions and the interplay as well as balancing of legislative, administrative and judicial decision-making - to assess the principles governing competencies of the EU in the area of food law against the background of their historical and political development - to evaluate the interplay between EU law and national legislative and administrative procedures - to develop an in-depth understanding of interpretation and application of different substantive rules of EU food law ranging from treaty provisions (e.g. market freedoms) to secondary legislation (e.g. basic regulation, labelling law, novel food regulation; GMO directive, hygiene package) - to recognize the basic structure of the external powers of the EU and its relevance to food law - to critically analyse landmark cases in EU food law and assess their impact on regulation and industry <p>Based on this knowledge, students are equipped with a detailed understanding of the EU-legal architecture governing food systems</p>
Content	<p>The course offers an in-depth analysis of the institutional and substantive foundations of EU food law. The course is divided into two thematic blocks. It starts with analyses of the legal design of different institutions in the regulatory framework of EU-Food Law, emphasising the relationship between general and special institutions such as the EFSA. The second block is concerned with the substantive structures and specifics of EU food law</p>
Teaching Formats	<p>lecture (2 hours per week) tutorial (2 hours per week)</p>
Requirements for Participation	<p>Prior participation in the module “Food law– from national to international perspectives” is recommended.</p>
Usability of the Module	<p>Credits towards continuation with specialisation 3 – Food Law – in module area C; prerequisite for module Current issues in European and international food trade economic(s) law and the module Current issues in European and international environment</p>

	law; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	written examination (100%)						
ECTS Points	5						
Frequency	summer semester (recommendation: 2nd semester)						
Workload	<table> <tr> <td>Lectures and seminars:</td> <td>60 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td>90 h</td> </tr> <tr> <td>Total:</td> <td>150 h</td> </tr> </table>	Lectures and seminars:	60 h	Self-study (incl. assessment)	90 h	Total:	150 h
Lectures and seminars:	60 h						
Self-study (incl. assessment)	90 h						
Total:	150 h						
Duration	1 semester						

Module Area	B – Specialisation - Electives
Module Title	Advanced Institutional and Substantive International Food Law
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Kai Purnhagen
Language	English
Learning outcomes	<p>The students acquire detailed and differentiated knowledge</p> <ul style="list-style-type: none"> - to demonstrate an in-depth understanding of the institutional framework governing international food law by distinguishing functions and the design of international bodies like the WTO, FAO and the Codex Alimentarius Commission as well as international human rights bodies - to understand the foundations and limits of peaceful dispute settlement mechanisms in international law - to develop an in-depth understanding of interpretation and application of different substantive rules of international food law ranging from general trade agreements (e.g. GATT) to specific trade and nontrade related regimes (e.g. TBT and SPS, TRIPS, Cartagena Protocol, human rights) - to understand the complexities between international trade law, environment, agriculture, public health and intellectual property rights - to recognize and assess the challenge of fragmentation of international law <p>Based on this knowledge, students are equipped with a detailed understanding of the International legal rules governing food systems</p>
Content	<p>The course offers an in-depth analysis of the institutional and substantive foundations of International food law. The course is divided into two thematic blocks. It starts with analyses of the legal design of different institutions in the regulatory framework of international food law. The second block is concerned with the substantive structures and specifics of International food law</p>
Teaching Formats	<p>Lecture (2 hours per week) Tutorial (2 hours per week)</p>
Requirements for Participation	<p>Prior participation in the module “Food law– from national to international perspectives” is recommended.</p>
Usability of the Module	<p>Credits towards continuation with Specialisation 3 - Food Law – in module area C; prerequisite for module Current issues in European and international food trade economic(s) law and the module Current issues in European and international environment law; open for students of the following study programmes: M.Sc. Food System Sciences</p>
Requirements for the Award of ECTS Points	written examination (100%)
ECTS Points	5

Module Handbook „Food System Sciences“ (M.Sc.)

Frequency	summer semester (recommendation: 2nd semester)	
Workload	Lectures and seminars:	60 h
	Self-study (incl. assessment)	90 h
	Total:	150 h
Duration	1 semester	

Module Area	B – Specialisation - Electives	
Module Title	Advanced Food Policy <i>Course Title: Global Political Economy of Food</i>	
Module Number		
Course Number		
Module Coordinator	Jun.-Prof. Dr. Tim Dorlach	
Language	English	
Learning outcomes	Students acquire a basic understanding of the political and economic processes that shape the world food system and global food security. Based on this knowledge, they are able to analyze current developments in global food governance and evaluate pertinent reform proposals.	
Content	<ul style="list-style-type: none"> - Structure and Development of the World Food System - Institutions and Actors of Global Food Governance - Reform Options for Global Food Governance 	
Teaching Formats	Lecture (2 hours per week)	
Requirements for Participation	none Literature recommendation: Clapp, J. (2020). <i>Food (3rd Edition)</i> . Polity.	
Usability of the Module	Credits towards continuation with Specialisations 3 – Food Law - and 4 – Bioeconomy – in module area C; open for students of the following study programmes: M.Sc. Global Food, Nutrition and Health, M.Sc. Environment, Climate Change and Health, M.Sc. Food System Sciences	
Requirements for the Award of ECTS Points	final essay (100%)/exam (100%)/portfolio [short exam (20%), final essay (80%)]	
ECTS Points	5	
Frequency	summer semester (recommendation: 2 nd semester)	
Workload	Lectures:	30 h
	Self-study (incl. assessment)	120 h
	Total:	150 h
Duration	1 semester	

Module Area	B – Specialisation - Electives
Module Title	Advanced Business Analytics
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Christian Fikar
Language	English
Learning outcomes	After completion of the course, students are able to use advanced business analytics concepts to analyse common and well-defined decision-making problems in the context of the bioeconomy. The focus is set on topics related to food supply chain management and decision-making in highly uncertain and dynamic settings.
Content	The course tackles: <ul style="list-style-type: none"> - Mathematical Optimization - Metaheuristics - Simulation - Data and Process Mining - Predictive Analytics
Teaching Formats	Lecture (2 hours per week) Seminar (2 hours per week)
Requirements for Participation	Prior participation in the module ‘Bioeconomy – sustainable production, business, and society’ is recommended.
Usability of the Module	Credits towards continuation with Specialisation 4 – Bioeconomy – in module area C; open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Written examination (60%), case studies and group assignments incl. presentations (40%)
ECTS Points	5
Frequency	Summer semester (recommendation: 2nd semester)
Workload	Lectures and seminars: 60 h Self-study (incl. assessment) 90 h Total: 150 h
Duration	1 Semester

Module Area	B – Specialisation - Electives	
Module Title	Advanced Theories in Food Studies	
Module Number		
Course Number		
Module Coordinator	Jun.-Prof. Dr. Tina Bartelmeß	
Language	English	
Learning outcomes	<p>In this module, students explore the social and cultural aspects of food. The students acquire knowledge about social science theories of food and nutrition. Based on this knowledge, students are able to identify social structures and cultural norms that influence food habits in real-life contexts. Furthermore, students are able to explain how food sociology can help to conceptualise the connections between individual food habits and wider social patterns. Finally, students are able to recognize the importance of food in the development of identities, cultures, group dynamics, symbolism, communication, and other sources of meaning in human life.</p>	
Content	<ul style="list-style-type: none"> - Sociological Perspectives on Food & Nutrition - Socio-ecological model of food behaviour - Food & Identity - Food & Migration - Food in the Media & Digital Food Cultures - Transforming Food Cultures 	
Teaching Formats	lecture and accompanying seminar (2 hours per week)	
Requirements for Participation	<p>none</p> <p>literature recommendations for preparation:</p> <ul style="list-style-type: none"> - Murcott, A. (2019). <i>Introducing the sociology of Food & Eating</i>. London, New York: Bloomsbury Academic. - Zhen, W. (2019). <i>Food Studies: A Hands-On Guide</i>. Bloomsbury Academic. 	
Usability of the Module	Credits towards continuation with Specialisation 4 - Bioeconomy - in module area C; open for students of the following study programmes: M.Sc. Food System Sciences, M.Sc. Global Food, Nutrition & Health	
Requirements for the Award of ECTS Points	Essay/written examination (100%)	
ECTS Points	5	
Frequency	summer semester (recommendation: 2nd semester)	
Workload	Lectures and seminars:	30 h
	Self-study (incl. assessment)	120 h
	Total:	150 h
Duration	1 semester	

Module Area	C - Specialisation						
Module Title	Current Issues in Analytical Sciences						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. Andreas Römpf						
Language	English						
Learning outcomes	The students deepen their knowledge about modern analytical techniques and apply this knowledge to develop strategies for the analysis of food composition and physiological effects. Furthermore, they know about the importance of study planning, sample preparation, data acquisition and analysis. They can develop strategies to answer food analysis questions.						
Content	Lectures will introduce current and future challenges and opportunities in analytical sciences. Students will further be guided to perform literature research, define own specific research questions, and discuss recent research developments in sample preparation protocols, separation techniques, spectroscopy and mass spectrometry and data analysis approaches.						
Teaching Formats	Lecture: 2 hours per week Lab course: 3 hours per week						
Requirements for Participation	Knowledge of basic analytical chemistry Prior participation in the module Advanced Analytics and Food Quality is recommended.						
Usability of the Module	Specialisation 1 – Analytics in Life Sciences ; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Written examination (60%), semester-long assignments (40%)						
ECTS Points	5						
Frequency	Winter semester (recommendation: 3rd semester)						
Workload	<table> <tr> <td>Lectures and lab course:</td> <td>75 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td>75 h</td> </tr> <tr> <td>Total:</td> <td>150 h</td> </tr> </table>	Lectures and lab course:	75 h	Self-study (incl. assessment)	75 h	Total:	150 h
Lectures and lab course:	75 h						
Self-study (incl. assessment)	75 h						
Total:	150 h						
Duration	1 semester						

Module Area	C - Specialisation						
Module Title	Current Issues in Biochemistry and Biotechnology of Microorganisms						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. Gerald Lackner						
Language	English						
Learning outcomes	In this module, students will unlock the potential of microorganisms as microbial cell factories for the sustainable production of natural products. The course provides a comprehensive understanding of biosynthetic pathways, metabolic engineering, and enzyme design, along with an introduction to synthetic biology. Moreover, it encompasses the fundamental aspects of bioprocess engineering.						
Content	<p>Lecture:</p> <ul style="list-style-type: none"> - Biosynthesis of nutrients, vitamins and secondary metabolites - Microbial bioprocess engineering - Genetic manipulation of microbes - Metabolic engineering - Protein and enzyme engineering - Synthetic microbiology <p>Laboratory course:</p> <ul style="list-style-type: none"> - Genetic engineering of microorganisms - Production of bioactive compounds (e.g., vitamins, antibiotics) - Enzyme production and analysis 						
Teaching Formats	<p>Lecture (2 hours per week)</p> <p>Laboratory course (3 hours per week)</p>						
Requirements for Participation	<p>Basic knowledge of microbiology, molecular biology and biochemistry.</p> <p>Practical experience in biology lab courses</p>						
Usability of the Module	Specialisation 1 – Analytics in Life Sciences ; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Written / oral examination (60%), semester-long assignments (40%)						
ECTS Points	5						
Frequency	Winter semester (recommendation: 3 rd semester)						
Workload	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-right: 20px;">Lectures and practical lab work:</td> <td style="text-align: right;">75 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td style="text-align: right;">75 h</td> </tr> <tr> <td>Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>	Lectures and practical lab work:	75 h	Self-study (incl. assessment)	75 h	Total:	150 h
Lectures and practical lab work:	75 h						
Self-study (incl. assessment)	75 h						
Total:	150 h						
Duration	1 semester						

Module Area	C - Specialisation						
Module Title	Current Issues in Cellular Responses to External Cues						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. Christian Riedel						
Language	English						
Learning outcomes	The students acquire detailed and differentiated knowledge about modern cell and molecular biology and its relevance to understand cellular responses to molecular food components. Furthermore, they know about the roles of food components in human health and disease. Based on this knowledge, they can develop (molecular) strategies to optimize the detection of food-associated health benefits.						
Content	Short lecture input will introduce current and future challenges and opportunities in cell and molecular biology. Students will further be guided to perform literature research, define own specific research questions, and discuss recent research developments in cell and molecular biology methods, signal transduction, and food-associated cellular effects on human physiology.						
Teaching Formats	Lecture/seminar (4 hours per week)						
Requirements for Participation	Knowledge of molecular biology Prior completion of the module Advanced Nutritional Biochemistry and Physiology is recommended						
Usability of the Module	Specialisation 1 – Analytics in Life Sciences ; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Portfolio: Essay (40%), Presentation (60%)						
ECTS Points	5						
Frequency	Winter semester (recommendation: 3rd semester)						
Workload	<table> <tr> <td>Lectures and seminars:</td> <td>60 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td>90 h</td> </tr> <tr> <td>Total:</td> <td>150 h</td> </tr> </table>	Lectures and seminars:	60 h	Self-study (incl. assessment)	90 h	Total:	150 h
Lectures and seminars:	60 h						
Self-study (incl. assessment)	90 h						
Total:	150 h						
Duration	1 semester						

Module Area	C - Specialisation								
Module Title	Current Issues in Nutritional Biochemistry and Immunology								
Module Number									
Course Number									
Module Coordinator	Prof. Dr. Janin Henkel-Oberländer								
Language	English								
Learning outcomes	The students acquire specific knowledge in the impact of nutrition in biochemical signalling and metabolic pathways. They understand the principles in immune response and can explain the organisation of the immune system. Based on this knowledge, they are able to understand the role of food composition and lifestyle behaviour in the context of human health and disease.								
Content	<p>Lecture and seminar topics will include:</p> <ul style="list-style-type: none"> - Nutritional regulation of gene expression - Regulation and control of cell cycle and cell death - Molecular mechanisms of dietary components in development of metabolic diseases (e.g. dietary fatty acids, cholesterol, fructose) - principal function and molecules of the immune system - impact of the innate and adaptive immune system and role of nutrition - Inflammatory response and development of metabolic diseases with chronic inflammation <p>Practical lab course with cell culture experiments and application of biochemical and molecular biological methods</p>								
Teaching Formats	<p>lecture (2 hours per week)</p> <p>seminar and practical work in the lab (3 hours per week)</p>								
Requirements for Participation	Prior participation in the modules 'Advanced nutritional biochemistry and physiology' and 'Advanced human physiology' is recommended.								
Usability of the Module	Specialisation 2 – Nutritional Physiology ; open for students of the following study programmes: M.Sc. Food System Sciences								
Requirements for the Award of ECTS Points	written examination (60%), semester-long assignment (40%)								
ECTS Points	5								
Frequency	Winter semester (recommendation: 3rd semester)								
Workload	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Lectures:</td> <td style="text-align: right;">30 h</td> </tr> <tr> <td>Seminar and lab course:</td> <td style="text-align: right;">45 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td style="text-align: right;">75 h</td> </tr> <tr> <td>Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>	Lectures:	30 h	Seminar and lab course:	45 h	Self-study (incl. assessment)	75 h	Total:	150 h
Lectures:	30 h								
Seminar and lab course:	45 h								
Self-study (incl. assessment)	75 h								
Total:	150 h								
Duration	1 semester								

Module Area	C – Specialisation
Module Title	Current Issues in Human Nutrition in Health and Disease
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Christian Riedel
Language	English
Learning outcomes	This cutting-edge course focuses the most current and relevant topics in the fields of human nutrition and the related health—disease—aging interplay. The student will explore recent research, emerging trends, and contemporary issues in these areas, gaining an in-depth understanding of how human nutrition impacts overall health including disease and aging conditions. The course aim is to prepare the student for careers in research, healthcare and (molecular) nutrition sciences.
Content	The lecture will cover: <ul style="list-style-type: none"> - Cellular Metabolism - Nutrition and cellular health - Nutrient-cell interaction in disease - Nutrient-cell interaction in aging The practical work will cover: <ul style="list-style-type: none"> - Cellular, molecular, and biochemical methods
Teaching Formats	Lecture (2 hours per week) Seminar and practical work in the lab (3 hours per week)
Requirements for Participation	Prior participation in the modules ‘Advanced nutritional biochemistry and physiology’ and ‘Advanced human physiology’ is recommended.
Usability of the Module	Specialisation 2 – Nutritional Physiology ; open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Written examination (60%), semester-long assignments (40%)
ECTS Points	5
Frequency	Summer semester (recommendation: 2 nd semester)
Workload	Lectures, seminar, and practical work in the lab: 75 h Self-study (incl. assessment) 75 h Total: 150 h
Duration	1 Semester

Module Area	C - Specialisation
Module Title	Current Issues in Cellular, Organismal, and Exercise Physiology/Biology
Module Number	
Course Number	
Module Coordinator	Prof. Dr. Frank Suhr
Language	English
Learning outcomes	This cutting-edge course focuses the most current and relevant topics in the fields of cellular biology, organismal physiology, and exercise physiology. The student will explore recent research, emerging trends, and contemporary issues in these areas, gaining an in-depth understanding of how cellular and physiological processes impact overall health, fitness and performance under health and disease. The course aim is to prepare the student for careers in research, healthcare and (molecular) exercise sciences.
Content	<p>The lecture will cover:</p> <ul style="list-style-type: none"> - Latest research and advancements in cellular biology, organismal physiology, and exercise physiology - integration of cellular processes into whole-body physiological responses - molecular mechanisms underlying exercise-induced adaptations - Relations to health, disease and aging <p>The practical work will cover:</p> <ul style="list-style-type: none"> - Cellular, molecular, and histological methods
Teaching Formats	Lecture (2 hours per week) Seminar and practical work in the lab (3 hours per week)
Requirements for Participation	Prior participation in the modules ‘Advanced nutritional biochemistry and physiology’ and ‘Advanced human physiology’ is recommended.
Usability of the Module	Specialisation 2 – Nutritional Physiology ; open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Written examination (60%), semester-long assignments (40%)
ECTS Points	5
Frequency	Winter semester (recommendation: 3 rd semester)
Workload	<p>Lectures, seminar, and practical work in the lab: 75 h</p> <p>Self-study (incl. assessment) 75 h</p> <p>Total: 150 h</p>
Duration	1 Semester

Module Area	C - Specialisation						
Module Title	Current Issues in Food and Health Policy <i>Course Title: Global Health Policy</i>						
Module Number							
Course Number							
Module Coordinator	Jun.-Prof. Dr. Tim Dorlach						
Language	English						
Learning outcomes	Students acquire a basic understanding of the political institutions and actors that shape global health outcomes. Based on this knowledge, they are able to analyze current developments in global health policy and to evaluate pertinent reform proposals.						
Content	<ul style="list-style-type: none"> - Political Determinants of Health - Institutions and Actors in Global Health Policy - Reform Options for Global Health Policy 						
Teaching Formats	lecture (2 hours per week)						
Requirements for Participation	none Literature recommendation: Clinton, C. & Sridhar, D. (2017). <i>Governing global health: Who runs the world and why?</i> . Oxford University Press.						
Usability of the Module	Specialisation 3 – Food Law ; open for students of the following study programmes: M.Sc. Global Food, Nutrition and Health, M.Sc. Environment, Climate Change and Health, M.Sc. Food Systems Science, M.A. Development Studies						
Requirements for the Award of ECTS Points	final essay (100%)/exam (100%)/portfolio [short exam (20%), final essay (80%)]						
ECTS Points	5						
Frequency	winter semester (recommendation: 3rd semester)						
Workload	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-left: 20px;">Lectures:</td> <td style="text-align: right;">30 h</td> </tr> <tr> <td style="padding-left: 20px;">Self-study (incl. assessment)</td> <td style="text-align: right;">120 h</td> </tr> <tr> <td style="padding-left: 20px;">Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>	Lectures:	30 h	Self-study (incl. assessment)	120 h	Total:	150 h
Lectures:	30 h						
Self-study (incl. assessment)	120 h						
Total:	150 h						
Duration	1 semester						

Module Area	C - Specialisation						
Module Title	Current Issues in European and International Food Trade Economic(s) Law						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. Kai Purnhagen						
Language	English						
Learning outcomes	<p>The students acquire detailed and differentiated knowledge</p> <ul style="list-style-type: none"> - to analyse major challenges and issues in the field of food law and their economic impact - to recognize emerging trends influencing the development of food law policies (e.g. climate change; technological impact such as digital traceability or genetically modified organisms; heightened obesity rates) - to further deepen the understanding of complexities between international trade law, environment, agriculture, public health and intellectual property rights - to further understand “law in action” by analysing current food trade law cases in the context of EU and international law 						
Content	The course identifies and analyses current issues of European and international food trade economic(s) law.						
Teaching Formats	Seminar (2 hours per week)						
Requirements for Participation	Prior participation in the modules Advanced institutional and substantive EU food law and Advanced institutional and substantive international food law						
Usability of the Module	Specialisation 3 – Food Law ; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Term paper (60%), presentation (40%)						
ECTS Points	5						
Frequency	winter semester (recommendation: 3rd semester)						
Workload	<table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">Lectures and seminars:</td> <td style="text-align: right;">30 h</td> </tr> <tr> <td style="padding-left: 20px;">Self-study (incl. assessment)</td> <td style="text-align: right;">120 h</td> </tr> <tr> <td style="padding-left: 20px;">Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>	Lectures and seminars:	30 h	Self-study (incl. assessment)	120 h	Total:	150 h
Lectures and seminars:	30 h						
Self-study (incl. assessment)	120 h						
Total:	150 h						
Duration	1 semester						

Module Area	C - Specialisation						
Module Title	Current Issues in European and International Environmental Law						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. Nils Grosche						
Language	English						
Learning outcomes	<p>The students acquire detailed and differentiated knowledge</p> <ul style="list-style-type: none"> - to analyse major challenges and issues in the field of environmental law - to recognize the complexities of legally balancing different aspects of economic development and protection of the environment as well as the underlying transnational dimension of many environmental challenges - to understand the need of EU and international environmental law to address the specific role of scientific uncertainty and to adapt to environmental changes - to further understand “law in action” by analysing current environmental cases in the context of EU and international law 						
Content	The course identifies and analyses current issues of European and international environmental law.						
Teaching Formats	Seminar (2 hours per week)						
Requirements for Participation	Advanced institutional and substantive EU food law and the module advanced institutional and substantive international food law						
Usability of the Module	Specialisation 3 – Food Law ; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Term paper (60%), presentation (40%)						
ECTS Points	5						
Frequency	winter semester (recommendation: 3rd semester)						
Workload	<table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">Lectures and seminars:</td> <td style="text-align: right;">30 h</td> </tr> <tr> <td style="padding-left: 20px;">Self-study (incl. assessment)</td> <td style="text-align: right;">120 h</td> </tr> <tr> <td style="padding-left: 20px;">Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>	Lectures and seminars:	30 h	Self-study (incl. assessment)	120 h	Total:	150 h
Lectures and seminars:	30 h						
Self-study (incl. assessment)	120 h						
Total:	150 h						
Duration	1 semester						

Module Area	C - Specialisation						
Module Title	Current Issues in Business Analytics						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. Christian Fikar						
Language	English						
Learning outcomes	After completion of the course, students are able to independently analyse complex decision-making settings and unstructured data. Furthermore, they can use this input to develop and implement business analytics methods to improve decision-making within the bioeconomy.						
Content	Students work on various current issues in the context of business analytics and the bioeconomy motivated by real industry cases or settings of high relevance to research. The students are presented a complex decision-making problem and corresponding input data. Afterwards, students develop tools and test the developed methods for their performance.						
Teaching Formats	Seminar (2 hours per week)						
Requirements for Participation	Successful completion of module ‘Bioeconomy – sustainable production, business, and society’						
Usability of the Module	Specialisation 4 – Bioeconomy ; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Portfolio: Essay (60%) and presentation (40%)						
ECTS Points	5						
Frequency	Winter semester (recommendation: 3rd semester)						
Workload	<table> <tr> <td>Seminars:</td> <td>30 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td>120 h</td> </tr> <tr> <td>Total:</td> <td>150 h</td> </tr> </table>	Seminars:	30 h	Self-study (incl. assessment)	120 h	Total:	150 h
Seminars:	30 h						
Self-study (incl. assessment)	120 h						
Total:	150 h						
Duration	1 Semester						

Module Area	C - Specialisation						
Module Title	Current Issues in Food Studies						
Module Number							
Course Number							
Module Coordinator	Jun.-Prof. Dr. Tina Bartelmeß						
Language	English						
Learning outcomes	Climate change affects our food system and our food system has a fundamental impact on the climate. Raising awareness of these connections and promoting transformations is currently a significant challenge for food studies. In this module, students acquire detailed and differentiated knowledge of theories, strategies, and methods of climate change communication. Furthermore, they know successful strategies of public engagement for food and health-related challenges of climate change and are able to develop their own creative communication approaches.						
Content	<ul style="list-style-type: none"> - Climate change communication research: theories, strategies, approaches - factors that influence public understanding of climate change - food, nutrition, and health in the context of climate change - innovative climate change communication approaches and strategies 						
Teaching Formats	seminar (2 hours per week)						
Requirements for Participation	basic knowledge on the linkages of food, nutrition, health, and climate change						
Usability of the Module	Specialisation 4 – Bioeconomy ; open for students of the following study programmes: M.Sc. Global Food Nutrition and Health, M.Sc. Food Quality and Safety, M.Sc. Food System Sciences, M.Sc. Environment, Climate Change and Health						
Requirements for the Award of ECTS Points	Seminar paper (60%), presentation (40%)						
ECTS Points	5						
Frequency	Summer semester (recommendation: 4th semester)						
Workload	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-right: 20px;">Lectures and seminars:</td> <td style="text-align: right;">30 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td style="text-align: right;">120 h</td> </tr> <tr> <td>Total:</td> <td style="text-align: right;">150 h</td> </tr> </table>	Lectures and seminars:	30 h	Self-study (incl. assessment)	120 h	Total:	150 h
Lectures and seminars:	30 h						
Self-study (incl. assessment)	120 h						
Total:	150 h						
Duration	1 semester						

Module Area	C - Specialisation						
Module Title	Current Issues in Sustainability and Production of Plant-based Foods						
Module Number							
Course Number							
Module Coordinator	Prof. Dr. A.C. (Corina) Vlot-Schuster Prof. Dr. Susanne Baldermann						
Language	English						
Learning outcomes	The students acquire detailed and differentiated knowledge about modern genetics and molecular approaches to improve the production of plant-based foods. Furthermore, they know about knowledge gaps and future challenges. Based on this knowledge, they can develop (molecular) strategies to improve food production, identify bottlenecks, and analyse possible solutions.						
Content	Short lecture input will introduce current and future challenges and opportunities to produce plant-based foods. Students will further be guided to perform literature research, define own specific research questions, and discuss recent research developments in plant molecular biology, physiology, and breeding focusing on innovative strategies to produce high-quality crops.						
Teaching Formats	Lecture/seminar (4 hours per week)						
Requirements for Participation	Knowledge of molecular biology and genetics Prior completion of the module Advanced Plant Breeding and Sustainable Food Production is recommended						
Usability of the Module	Specialisation 4 – Bioeconomy ; open for students of the following study programmes: M.Sc. Food System Sciences						
Requirements for the Award of ECTS Points	Semester-long assignments						
ECTS Points	5						
Frequency	Winter semester (recommendation: 3rd semester)						
Workload	<table> <tr> <td>Lectures and seminars:</td> <td>60 h</td> </tr> <tr> <td>Self-study (incl. assessment)</td> <td>90 h</td> </tr> <tr> <td>Total:</td> <td>150 h</td> </tr> </table>	Lectures and seminars:	60 h	Self-study (incl. assessment)	90 h	Total:	150 h
Lectures and seminars:	60 h						
Self-study (incl. assessment)	90 h						
Total:	150 h						
Duration	1 semester						

Module Area	D – Professional competences across specialisations
Module Title	Research Seminar Food System Sciences
Module Number	
Course Number	
Module Coordinator	Prof. Dr. A.C. (Corina) Vlot-Schuster Prof. Dr. Frank Suhr
Language	English
Learning outcomes	Students can reflect upon and extend their theoretical knowledge in research seminars held by scientists and other professionals working in Food System Sciences. They will further gain a better understanding of the state-of-the-art and of how research contributes to transforming the state-of-the-art. Furthermore, students will train their presentation and discussion skills in own presentations to an expert audience.
Content	Depending on local and invited guest speakers
Teaching Formats	Seminar (1 hour per week)
Requirements for Participation	
Usability of the Module	Open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Semester-long assignments
ECTS Points	3
Frequency	Winter and summer semester (recommendation: 3 rd and 4 th semester)
Workload	Seminar and self-study (incl. assessment): 90 h
Duration	2 semesters

Module Area	D – Professional competences across specialisations
Module Title	(Research) Internship
Module Number	
Course Number	
Module Coordinator	All professors
Language	Depending on internship place
Learning outcomes	Students can apply their theoretical knowledge in research or related practical activities and learn to train their research as well as their soft skills through autonomous endeavours and teamwork. Furthermore, students can independently reflect upon and professionalise their own competences.
Content	Depending on internship place; please note that the internship place in this module should be different from Research Internship II.
Teaching Formats	Full-time internship of at least 9 weeks or two full-time internships of at least 4,5 weeks each
Requirements for Participation	
Usability of the Module	The Internship may be used to reflect upon/prepare for possible master’s thesis topics – in this case, it is recommended to combine two internships of 4,5 weeks each at two chairs of the university; open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Internship report (written and oral) graded with a pass
ECTS Points	12
Frequency	Winter and summer semester (recommendation: 3 rd semester)
Workload	Internship and self-study (incl. assessment): 360 h
Duration	1 semester

Module Area	E – Master’s Thesis
Module Title	Master’s Thesis
Module Number	
Course Number	
Module Coordinator	All professors
Language	German or English
Learning outcomes	Students acquire the ability to work independently on a comprehensive research question within a given period using scientific methods. In addition to the technical competence required for this, students have further developed their methodological competence and self-competence in the process.
Content	Formulating an adequate research question (topic identification), developing a concept/hypothesis, literature research, data collection and evaluation or literature and source analysis, writing a scientific thesis.
Teaching Formats	Independent research under supervision
Requirements for Participation	It is recommended to have completed the modules from semesters 1-3.
Usability of the Module	Open for students of the following study programmes: M.Sc. Food System Sciences
Requirements for the Award of ECTS Points	Master’s thesis
ECTS Points	30
Frequency	Winter and summer semester (recommendation: 4 th semester)
Workload	Self-study (incl. assessment): 900 h
Duration	The thesis needs to be submitted no later than six months after the registration of the thesis at the examination office.

Explanatory Notes

- This module handbook has been prepared with the utmost care. However, due to the wealth of material, inconsistencies may occur. Therefore, no guarantee can be given for the correctness of the information. The General and Subject-Specific Examination and Study Regulations in their valid version are binding (see [“Amtliche Bekanntmachungen der Universität Bayreuth”](#)).
- The scope and duration of the respective examination forms are specified in §9 of the General Examination and Study Regulations for the Bachelor's and Master's degree programmes of the Faculty of Life Sciences: Food, Nutrition and Health (APSO-LEG) (see [“Amtliche Bekanntmachungen der Universität Bayreuth”](#)).
- Slashes ("/") in the examinations (section “Requirements for the Award of ECTS Points”) correspond to an "or" and mark alternative examination forms; commas (",") correspond to an "and" and mark partial examinations.
- If you have any questions or uncertainties regarding organisation and course content, please contact the respective module coordinator.