

IEW-PEN-13: Nutrition Science: Basics and Methods		Number of credit points (CP): 8		
Module type (compulsory or elective module):	Depends on the degree program			
Content and objectives of the module:	<p><u>Content:</u></p> <ul style="list-style-type: none"> - anatomy and function (gastrointestinal tract, fat tissue, muscles, liver, kidneys, immune system) - metabolism, macronutrients, energy metabolism, metabolism with diet & exercise - molecular biological basics of nutrition - pathophysiology and biochemistry of nutrition-related chronic diseases such as obesity, cancer, type II diabetes, cardiovascular diseases, allergies, inflammatory bowel diseases, and neurodegenerative diseases - underlying molecular and metabolic mechanisms, nutritional influences (diet, food components) - published data from scientific publications as well as vitro and in vivo experiments (animal and human) <p><u>Qualification objectives:</u></p> <p>Students have in-depth knowledge of the molecular causes and pathophysiology of nutrition-related diseases. They can interpret data from scientific experiments in publications and evaluate their validity and limitations. They are able to develop proposals for experiments to solve a scientific problem. On the basis of the knowledge they have acquired, they can place the content of original scientific publications in a broader thematic context and present the results of scientific experiments in writing and orally.</p>			
Module (sub-)examination (number, form, scope):	One examination of the following formats: Term paper, approx. 4000 words Written exam, 180 min Oral exam, 30 min			
Independent study time (in hours (h)):	180			
Courses (teaching formats)	Contact time (in hours per week per semester)	Secondary examinations (number, form, scope)		Course-accompanying module (sub-) examination(s) (number, form, scope)
		For completing the module	For admission to the module exam	
Revision Course Basics of Nutrition Science (Anatomy, Biochemistry, and Physiology Unit; Block Course) (lecture)	2	-	-	-
Molecular Causes of Nutrition-Dependent Diseases (Overview Lectures Unit) (lecture)	2	-	-	-
Epidemiology, Physiology and Human Nutrition (Physiology/Energy Metabolism Unit) (lecture)	2	-	-	-
Frequency at which the module is offered:	Winter semester			
Prerequisite for taking the module:	In order to achieve the qualification objectives, it is recommended that students refresh their basic knowledge in the areas of anatomy, physiology and/or cell biology general and inorganic chemistry, organic chemistry, and food chemistry.			

Teaching unit(s):	Revision Course Basics of Nutrition Science (Anatomy, Biochemistry, and Physiology Unit; Block Course) (lecture): Nutrition Science Molecular Causes of Nutrition-Dependent Diseases (Overview Lectures Unit) (lecture): Nutrition Science Epidemiology, Physiology and Human Nutrition (Physiology/Energy Metabolism Unit) (lecture) Nutrition Science
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IEW-PEN-17: Nutrition Science: Applied Methods and Advanced Analysis		Number of credit points (CP): 8		
Module type (compulsory or elective module):	Depends on the degree program			
Content and objectives of the module:	<p><u>Content:</u></p> <ul style="list-style-type: none"> - current issues in nutrition science - modern survey and analysis methods in nutrition science and metabolomics (e.g. analytical biomarkers as indicators of nutrient intake) - basics for the independent planning and implementation of experiments - analysis and visualization of complex data <p><u>Qualification objectives:</u></p> <p>Students have in-depth knowledge of current issues in nutrition science and are able to work on theoretical content on the basis of specialist scientific publications and to reflect, communicate, and discuss these in a critical manner. Students know and understand modern analysis methods and techniques and are familiar with their advantages and disadvantages, challenges, opportunities, and limitations. They have acquired in-depth methodological knowledge for empirical research and can apply it.</p>			
Module (sub-)examination (number, form, scope):	One examination of the following formats: Term paper, approx. 2000 words Written exam, 90 minutes Oral exam, 30 min			
Independent study time (in hours (h)):	180			
Courses (teaching formats)	Contact time (in hours per week per semester)	Secondary examinations (number, form, scope)		Course-accompanying module (sub-) examination(s) (number, form, scope)
		For completing the module	For admission to the module exam	
Methods of Nutrition Science (lecture)	2	-	-	-
Current Topics in Nutrition Science (seminar)	2	Presentation (15 minutes)	-	-
Frequency at which the module is offered:	Summer semester			
Prerequisite for taking the module:	none			
Teaching unit(s):	Nutrition Science			

IEW-PEN-21: Nutrition Science: Research Internship		Number of credit points (CP): 15		
Module type (compulsory or elective module):	Depends on the degree program			
Content and objectives of the module:	<p><u>Content:</u></p> <ul style="list-style-type: none"> - research internship/tandem research project including topic search and exposé - nutrition science-based laboratory work - research methods related to the specificity of the laboratory or specific current research projects/planned studies, e.g. <ul style="list-style-type: none"> - western blot analysis - LC-MS analysis - flow cytometry for cell analysis, electrophoretic mobility shift assays, isolation, identification, and sensory evaluation of volatile substances - brain and intestinal function analysis - functional genomics in animals - investigations of peptide transporters - analysis of mitochondrial respiration <p><u>Qualification objectives:</u></p> <p>After an introduction and initial instructions, students are able to carry out a scientific experiment in molecular nutrition research independently (at least nine-week laboratory internship). They are able to document and evaluate the results and to place their own results in a broader thematic context and discuss them in the context of scientific literature. They can present the results of scientific experiments in writing and orally and are able to find a suitable topic for an empirical master's thesis in nutrition science and prepare an exposé on it.</p>			
Module (sub-)examination (number, form, scope):	Portfolio examination, on empirical research work during the internship; consisting of a project/internship report on empirical research work during the internship in publication form (CONSORT) (75 percent share, max. 20 pages) and the presentation of the project/internship report (25 percent share, 20 minutes)			
Independent study time (in hours (h)):	60			
Courses (teaching formats)	Contact time (in hours per week per semester)	Secondary examinations (number, form, scope)		Course-accompanying module (sub-) examination(s) (number, form, scope)
		For completing the module	For admission to the module exam	
Research Project/Internship (during the semester, full-day) (practical component)	Supervision: 4	active and regular participation (80%) in the planning, implementation, and evaluation of the empirical research work; compulsory attendance (at least 80%)	-	-
Specific Research Methods in Nutrition Science (seminar or recitation course)	2	Exposé (approx. 2-5 pages) on the empirical thesis	-	-
Frequency at which the module is offered:	Winter semester			
Prerequisite for taking the module:	none			
Teaching unit(s):	Nutrition Science			

