



MODULE DESCRIPTIONS

NUTRITION and BIOMEDICINE Master of Science

Academic Faculty of Nutrition
TECHNISCHE UNIVERSITÄT MÜNCHEN

Name: *Nutrition and Biomedicine*

Organizational assignment: *Study Program Division of Nutrition*

Degree: *Master of Science (M.Sc.)*

**Standard duration of study
(Credits):** *4 semesters (120 Credits)*

Study mode: *Full time on campus*

Intake: *Winter term*

Language of instruction: *English*

**Responsible person for the study
program:** *Prof. Dr. Martin Klingenspor*

Contact persons: *Isabelle Dörr M.A.
Dr. Sabine Köhler
Office of Student Affairs
phone +49 8161 71-3336;
email: nutritionsciences@tum.de*



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	Public Health and Nutrition	
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	Mitochondrial Biology	
	Design and Analysis of Experiments	
	Health Behaviour and Health Promotion	
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1 Curriculum

Semester 1	Semester 2	Semester 3	Semester 4
Basics in Nutrition and Food block course 3 ECTS	Nutrition and Microbe-host Interactions 5 ECTS	Research Internship 8 weeks lab course 12 ECTS	Master's Thesis 30 ECTS
Nutrition in Life Stages 5 ECTS	Energy Balance and Regulation 5 ECTS	Electives 15 ECTS	
Research Tools I 5 ECTS	Research Tools II 5 ECTS		
Recent Topics 6 ECTS			
Integrated Lab Course 9 ECTS			
Bioactive Food Constituents 10 ECTS			
Disease Pathologies and Nutrition 10 ECTS			



2 Required modules first semester

Module: Basics in Nutrition and Food	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Basics in Nutrition and Food
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	2 weeks at the beginning of semester 1
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	3
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	60
Eigenstudiumsstunden / self-study hours:	30
Gesamtstunden / total workload:	90
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	120 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	no
Beschreibung / description	
Inhalt / content:	
<p>The lecture Basics in Nutrition and Food will cover all nutrients of importance for human nutrition. This includes fats and fatty acids, monosaccharides, oligosaccharides and polycarbohydrates, proteins and amino acids and the metabolic reactions involved in the anabolism and catabolism of these compounds. The part on micronutrients will cover vitamins, mass elements, trace elements and touch on distinct metabolic functions of the various compounds. Lectures on foodstuffs will provide an overview on the generation and composition of foods from plant or animal origins, shelf life and spoilage.</p>	
Angestrebte Lernergebnisse / learning outcomes:	
<p>The general intention of this module is to provide propaedeutics for nutritional sciences, i.e. the knowledge which is necessary to understand the scientific background of this discipline. This course will be the first contact with nutritional sciences for those students who come from other backgrounds. In addition, it will mean a repetition and refreshment of basic concepts and ideas for those students who have already performed bachelor's studies in this field.</p> <p>At the end of the module the participants will be able to differentiate between macronutrients and micronutrients, essential and non-essential compounds of food materials. The basic metabolic reactions in the metabolism of proteins/amino acids, carbohydrates and triglycerides/fatty acids will be refreshed. The students will know about the relative amounts in which the essential compounds have to be supplied, will be able to differentiate between trace elements, ultra-trace elements and elements needed in higher quantity. This will enable the students to critically assess nutritional recommendations and understand how the processing and storage of foodstuffs influences their nutritional value and quality.</p>	



Empfohlene Voraussetzungen / recommended prerequisite:	no specific requirements
Lern-/Lehrmethoden / teaching/studying methods:	lecture and discussion
Modulverantwortliche / module manager	
Vorname / first name:	Hannelore
Nachname / last name:	Daniel
MyTUM Email:	nutrition@tum.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Hannelore
Nachname / last name:	Daniel
Institution:	Chair for Nutritional Physiology
MyTUM Email:	nutrition@tum.de
2. Dozent / 2nd lecturer	
Vorname / first name:	Jürgen
Nachname / last name:	Stolz
Institution:	Chair for Nutritional Physiology
MyTUM Email:	stolz@tum.de
3. Dozent / 3rd lecturer	
Vorname / first name:	Ingrid
Nachname / last name:	Schmöller
Institution:	Chair for Biofunctionality of Food
MyTUM Email:	ingrid.schmoeller@tum.de
4. Dozent / 4th lecturer	
Vorname / first name:	Tobias
Nachname / last name:	Fromme
Institution:	Chair for Molecular Nutritional Medicine
My TUM Email:	tobias.fromme@tum.de
5. Dozent / 5th lecturer	
Vorname / first name:	Bernhard
Nachname / last name:	Bader
Institution:	Chair for Nutritional Medicine
My TUM Email:	bernhard.bader@tum.de
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / Type:	lecture
Name / name:	Basics in Nutrition and Food
Semesterwochenstunden / semester periods per week:	4 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



Module: Research Tools I

Allgemeine Daten / general data

Modulbezeichnung / module name:	Research Tools I
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5

Arbeitsaufwand / workload

Präsenzstunden / contact hours:	50
Eigenstudiumsstunden / self-study hours:	100
Gesamtstunden / total workload:	150

Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement

Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	90 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	no

Beschreibung / description

Inhalt / content:

The module Research Tools I consists of the lectures Nutritional Systems Biology and Clinical Studies. The lecture Nutritional Systems Biology will cover the (molecular) biology of model organisms and their advantages & disadvantages for biomedical research, DNA arrays and gene expression analysis, genetic heterogeneity (coding and non-coding SNPs), proteomics and metabolomics, as well as approaches for data analysis and visualization. Most „omics“ techniques will be covered. Clinical Studies as research tool will be explained. The lecture spans the development from the first idea to the complete study protocol. Legal and ethical aspects will be addressed as well as definitions of study inherent activities. Side effects of drugs and their consequences as well as practical aspects on the basis of recent health scandals will be highlighted.

Angestrebte Lernergebnisse / learning outcomes:

At the end of the module the participants are able to evaluate modern analytical techniques that are designed for massively parallel analyses of biological samples. They will be able to judge the advantages and disadvantages of these techniques and get an idea about the opportunities and challenges, possibilities, drawbacks and limitations of existing techniques and experimental systems. This will include some basic knowledge of biological model organisms that are generally employed in nutrition research.

At the end of the lecture Clinical Studies the students will be able to compile all necessary documents for clinical studies. They will be able to write publications on the basis of currently accepted standards (e.g. CONSORT) for clinical studies. Finally, the students will have tools available to judge the quality of a study based on the study design. This will also contribute to a better evaluation of the degree of scientific evidence of publications.



Empfohlene Voraussetzungen / recommended prerequisite:

For Nutritional Systems Biology basic knowledge in molecular cell biology, genetics and metabolism, classical laboratory methods (such as SDS-PAGE, Western Blot, Northern Blot), bioinformatic tools and instrumentation is necessary.

For Clinical Studies pathophysiology of important metabolic disorders (e.g. diabetes mellitus type 2, dyslipidemia) facilitates the design of intervention studies. Basic statistical knowledge is necessary for calculating effect size and power of the study etc.

Medienformen / media forms:

In the Clinical Studies lecture we will use pdf files that cover the generally accepted guidelines for the various study types. Furthermore, a white board is needed for the development of statistical calculations concerning number needed to treat, number needed to harm etc. Practical evaluations will be performed with handouts of study protocols and by examples from original publications. The lecture “nutritional systems biology” will cover recent publications using the discussed methods. Teaching will be using PowerPoint presentations and the pdf files of these presentations will be available for the students who have enrolled in the course.

Lern-/Lehrmethoden / teaching/studying methods:	Lectures, recapitulations and discussions
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Modulverantwortliche / module manager

Vorname / First name:	Jürgen
Nachname Last name:	Stolz
MyTUM-Email:	stolz@tum.de

Dozent / lecturer

1. Dozent / 1st lecturer

Vorname / first name:	Hannelore
Nachname / last name:	Daniel
Institution:	Chair for Nutritional Physiology
MyTUM-Email:	nutrition@tum.de

2. Dozent / 2nd lecturer

Vorname / first name:	Hans
Nachname / last name:	Hauner
Institution:	Chair for Nutritional Medicine
MyTUM-Email:	Hans.hauner@tum.de

3. Dozent / 3rd lecturer

Vorname / first name:	Thomas
Nachname / last name:	Skurk
Institution:	Chair for Nutritional Medicine
MyTUM-Email:	thomas.skurk@tum.de

4. Dozent / 4th lecturer

Vorname / first name:	Britta
Nachname / last name:	Spanier
Institution:	Chair for Nutritional Physiology
My TUM-Email:	spanier@tum.de

5. Dozent / 5th lecturer

Vorname / first name:	Helmut
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Nachname / last name:	Laumen
Institution:	Chair for Nutritional Medicine
My TUM-Email:	laumen@wzw.tum.de
6. Dozent / 6th lecturer	
Vorname / first name:	Ulrike
Nachname / last name:	Amann-Gassner
Institution:	Chair for Nutritional Medicine
My TUM-Email:	ulrike.amann-gassner@wzw.tum.de
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Nutritional Systems Biology
Semesterwochenstunden / weekly hours per term:	2 SWS
2. LV / 2 nd course:	
Art / type:	lecture
Name / name:	Clinical Studies
Semesterwochenstunden / semester periods per week:	1 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



Module: Nutrition in Life Stages	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Nutrition in Life Stages
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	60
Eigenstudiumsstunden / self-study hours:	90
Gesamtstunden / total workload:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	60 minutes
Hausaufgaben / homework:	
Hausarbeit / term paper:	
Vortrag / oral presentation:	
Gespräch / oral examination:	
Beschreibung / description	
Inhalt / content: <i>wird nachgeliefert!</i>	
Angestrebte Lernergebnisse / learning outcomes: <i>wird nachgeliefert!</i>	
(Empfohlene) Voraussetzungen / recommended prerequisite:	
Medienformen / media forms:	
Literatur / literature:	
Lern-/Lehrmethoden / teaching/studying methods:	
Modulverantwortliche / module manager	
Vorname / first name:	Heiko
Nachname / last name:	Witt
MyTUM-Email:	heiko.witt@lrz.tu-muenchen.de



Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Heiko
Nachname / last name:	Witt
Institution:	TUM, Paediatric Nutritional Medicine
MyTUM-Email:	heiko.witt@lrz.tu-muenchen.de
Lehrveranstaltungen / course	
1. LV / 1st course:	
Art / type:	lecture
Name / name:	Nutrition in Life Stages
Semesterwochenstunden / weekly hours per term:	2 SWS
2. LV / 2nd course:	
Art / type:	seminar
Name / name:	Nutrition in Life Stages
Semesterwochenstunden / semester periods per week:	2 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1st study program	
Name / name:	Nutrition and Biomedicine



3 Required modules first and second semester

Module: Recent Topics	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Recent Topics
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	2 terms
Häufigkeit / term:	winter term and summer term
Sprache / language:	English
ECTS (credits):	6
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	60
Eigenstudiumsstunden / self-study hours:	120
Gesamtstunden / total workload:	180
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	graded term paper
Prüfungsdauer / exam duration:	
Hausaufgaben / homework:	yes
Hausarbeit / term paper:	yes (term paper)
Vortrag / oral presentation:	no
Gespräch / oral examination:	no
Beschreibung / description	
Inhalt / content:	
<p>The lecture communicates the relevance of transdisciplinary knowledge in the area of nutritional biomedicine and food research. A selection of current research topics is to be presented. Original papers addressing most recent developments in nutritional biomedicine research are discussed and evaluated.</p>	
Angestrebte Lernergebnisse / learning outcomes:	
<p>Students have insight into up-to-date research topics along the line of food sciences and biomedicine on the TUM campus and beyond (external lecturers). They apply their abilities in reading and understanding of original research papers as well as in the critical assessment of data. They can discuss and evaluate research results together with their peers. In a self-contained manner they identify unsolved scientific questions and can outline new research ideas. They are able to apply this knowledge in a term paper.</p>	
Empfohlene Voraussetzungen / recommended prerequisite:	knowledge in life sciences and food sciences;
Medienformen / media forms:	presentations, original research papers and review articles
Lern-/Lehrmethoden / teaching/studying methods:	lectures with subsequent discussions



Modulverantwortliche / module manager	
Vorname / first name:	Martin
Nachname / last name:	Klingenspor
MyTUM-Email:	mk@tum.de
Dozent / lecturer	
1. Dozent / 1 st lecturer	
Vorname / first name:	invited lecturers
Nachname / last name:	
Institution:	
MyTUM-Email:	
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Recent Topics
Semesterwochenstunden / semester periods per week:	4 SWS
Zuordnung / Assignment Curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



Module: Integrated Lab Course	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Integrated Lab Course
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	2 terms
Häufigkeit / term:	winter term and summer term
Sprache / language:	English
ECTS (credits):	9
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	120
Eigenstudiumsstunden / self-study hours:	150
Gesamtstunden / total workload:	270
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	graded protocol
Prüfungsdauer / exam duration:	
Hausaufgaben / homework:	no
Hausarbeit / term paper:	yes (protocols)
Vortrag / oral presentation:	no
Gespräch / oral examination:	no
Beschreibung / description	
Inhalt / content:	
<p>On the basis of selected experimental research topics in nutrition and food sciences students gain practical knowledge in a broad spectrum of methods:</p> <ul style="list-style-type: none"> A. Western blot B. Mycotoxins in the food chain C. Neurogastroenterology D. Flow cytometry for cell cycle studies E. Detection of the Cry-Protein in gene modified food of plant origin F. Isolation, identification and sensory evaluation of volatiles G. Functional genomics in animals H. Gas chromatography and HPLC for the analysis of lipids and alcohols I. Drying J. LC-MS-Analysis of plant extracts K. Investigation of peptide transporters in a mammalian kidney cell line and the nematode <i>C. elegans</i> L. Tumor metastasis in mouse models M. Mitochondrial respiration 	
Angestrebte Lernergebnisse / learning outcomes:	
<p>Upon successful completion students will know a broad spectrum of methods applied in experimental nutrition and food sciences. They will be able to apply these methods, analyze the raw data, and generate laboratory protocols of the experimental work. They will evaluate their obtained results in a self-contained manner. Students will have developed the ability to apply the methods to new research questions.</p>	



Empfohlene Voraussetzungen / recommended prerequisite:	basics of nutrition and food science, PC basics
Medienformen / media forms:	Experimental instructions will be made available on the Moodle platform
Literatur / literature:	The responsible tutors will specify text books and other literature sources required to prepare for each lab course.
Lern-/Lehrmethoden / teaching/studying methods:	practical course
Modulverantwortliche / module manager	
Vorname / first name:	Martin
Nachname / last name:	Klingenspor
MyTUM-Email:	mk@tum.de
Dozent / lecturer	
Experiment:	Dozent / lecturer:
Western blot	Prof. Hauner, Chair for Nutritional Medicine
Mycotoxins in the food chain	Prof. Bauer, Chair for Animal Hygiene
Neurogastroenterology	Prof. Schemann, Chair for Human Biology
Flow cytometry for cell cycle studies	Prof. Haller, Chair for Biofunctionality of Food
Detection of the Cry-Protein in gene modified food of plant origin	Dr. Riedmeier, Dr. Pfaffl, ZIEL Research Center for Nutrition and Food Sciences, Department of Physiology
Isolation, identification and sensory evaluation of volatiles	Prof. Engel, Chair for General Food Technology
Functional genomics in animals	Prof. Fries, Chair for Animal Breeding
Gas chromatography and HPLC for the analysis of lipids and alcohols	Prof. Hofmann, ZIEL, Department of Bioanalytics
Drying	Prof. Kulozik, Chair for Food Process Engineering and Dairy Science
LC-MS-Analysis of plant extracts	Prof. Schwab, Associate Professor for Biotechnology of Natural Products
Investigation of peptide transporters in a mammalian kidney cell line and the nematode <i>C. elegans</i>	Prof. Daniel, Chair for Nutritional Physiology
Tumor metastasis in mouse models	Prof Krüger, TUM, Institute for Experimental Oncology
Mitochondrial respiration	Prof Klingenspor, Chair for Molecular Nutritional Medicine
Lehrveranstaltungen / course	
1. LV / 1 st course	
Art / type:	exercise course
Name / name:	Integrated Lab Course
Semesterwochenstunden / semester periods per week:	8 SWS
Zuordnung / Assignment Curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



4 Required modules first, second and third semester

Module: Bioactive Food Constituents	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Bioactive Food Constituents
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	3 terms
Häufigkeit / term:	winter term and summer term
Sprache / language:	English
ECTS (credits):	10
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	90
Eigenstudiumsstunden / self-study hours:	210
Gesamtstunden / total workload:	300
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	120 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / oral examination:	no
Beschreibung / description	
Inhalt / content:	
<p>The lecture series Bioactive Food Constituents deals with the interplay of essential and non-essential food components with nutrition-related diseases. Additionally, biomedical background knowledge is imparted. The main focus is on how functionality can be proved by clinical studies and to demonstrate possible mechanisms of action considering bioavailability and pharmacokinetics. The seminar, consisting of practical exercises including literature search, deepens the knowledge imparted in the lecture series. Here, the main focus is on functional food and the implementation of health claims by the European Food Safety Authority (EFSA).</p>	
Angestrebte Lernergebnisse / learning outcomes:	
<p>Students gain biomedical knowledge on the effects of functional food and its bioactive components in the context of prevention or treatment of nutrition-related diseases. At the end of the module students are able to evaluate clinical studies and to put them into a scientific context. Additionally, students are able to acquire information needed to implement health claims independently.</p>	
Empfohlene Voraussetzungen / recommended prerequisite:	basics in biofunctionality
Literatur / literature:	will be announced by the lecturer and the tutors
Lern-/Lehrmethoden / teaching/studying methods:	lecture and seminar (teamwork)



Modulverantwortliche / module manager	
Vorname / first name:	Dirk
Nachname / last name:	Haller
MyTUM-Email:	dirk.haller@tum.de
Dozent / lecturer	
1. Dozent / 1 st lecturer	
Vorname / first name:	Dirk
Nachname / last name:	Haller
Institution:	Chair for Biofunctionality of Food
MyTUM-Email:	dirk.haller@tum.de
2. Dozent / 2 nd lecturer	
Vorname / first name:	
Nachname / last name:	different lecturers
Institution:	
MyTUM-Email:	
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Bioactive Food Constituents
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2 nd course:	
Art / type:	lecture
Name / name:	Bioactive Food Constituents
Semesterwochenstunden / semester periods per week:	2 SWS
3. LV / 3 rd course:	
Art / type:	seminar
Name / name:	Bioactive Food Constituents
Semesterwochenstunden / semester periods per week:	2 SWS
Zuordnung / assignment curriculum	
1. Studiengang / study program:	
Name / name:	Nutrition and Biomedicine



Module: Disease Pathologies and Nutrition	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Disease Pathologies and Nutrition
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	3 terms
Häufigkeit / term:	winter term and summer term
Sprache / language:	English
ECTS (credits):	10
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	90
Eigenstudiumsstunden / self-study hours:	210
Gesamtstunden / total workload:	300
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	120 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / oral examination:	no
Beschreibung / description	
Inhalt / content: The lectures are dealing with the pathophysiology of selected common nutrition-related chronic disease such as obesity, type 2 diabetes, cardiovascular diseases, certain types of cancer (colorectal cancer, breast cancer, alcohol-associated cancer), neurodegenerative diseases, age-related macula degeneration among others. Nutritional influences are particularly addressed. Based on the understanding of causes and mechanisms the potential of nutritional intervention for the prevention, progression and treatment of these diseases is introduced	
Angestrebte Lernergebnisse / learning outcomes: At the end of the module students are able to understand the pathological correlations of disease processes and they are able to address specific aspects of the introduced nutrition-related diseases. Based on this knowledge they are able to develop evidence-based strategies for the prevention and treatment of these diseases.	
Empfohlene Voraussetzungen / recommended prerequisite:	basics in nutritional medicine
Literatur / literature:	t.b.a.
Lern-/Lehrmethoden / teaching/studying methods:	lectures, teamwork, homework



Modulverantwortliche / module manager	
Vorname / first name:	Hans
Nachname / last name:	Hauner
MyTUM-Email:	hans.hauner@tum.de
Dozent / lecturer	
1. Dozent / 1 st lecturer	
Vorname / first name:	Hans
Nachname / last name:	Hauner
Institution:	Chair for Nutritional Medicine
MyTUM-Email:	hans.hauner@tum.de
2. Dozent / 2 nd lecturer	
Vorname / first name:	Bernhard
Nachname / last name:	Bader
Institution:	Chair for Nutritional Medicine
MyTUM-Email:	bernhard.bader@tum.de
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Disease Pathologies and Nutrition
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2 nd course:	
Art / type:	lecture
Name / name:	Disease Pathologies and Nutrition
Semesterwochenstunden / semester periods per week:	2 SWS
3. LV / 3 rd course:	
Art / type:	seminar
Name / name:	Disease Pathologies and Nutrition
Semesterwochenstunden / semester periods per week:	2 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



5 Required modules second semester

Module: Research Tools II	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Research Tools II
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	summer term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	50
Eigenstudiumsstunden / self-study hours:	100
Gesamtstunden / total workload:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	90 minutes
Hausaufgaben / homework:	yes
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	no
Beschreibung / description	
Inhalt / content:	
Use of public databases for the analysis of gene and protein sequences. Application of open source and commercial software for the analysis of sequences related to nutritional biomedicine and biological sciences. Topics: Genomes, sequence archives, alignments, polymerase chain reaction, cloning, molecular phylogeny, primary structures of proteins, functional domains und 3D-structures, promoter analysis, polymorphisms.	
Angestrebte Lernergebnisse / learning outcomes:	
At the end of the module students have gained basic knowledge in bioinformatics and can apply this to solve new problems related to nutritional biomedicine and biological sciences. They are able use their knowledge to solve practical problems.	
Empfohlene Voraussetzungen / recommended prerequisite:	background in molecular biology and genetics; basic computer skills; participants must have a laptop with admin rights.
Medienformen / media forms:	presentations, exercise sheets, web links available on moodle platform
Literatur / literature:	The lecturer recommends textbooks covering molecular genetics, biochemistry and evolutionary biology at start of term. Initial sequencing and analysis of the human genome (409;860-921; Nature 2001) Initial sequencing and comparative analysis of the mouse



	genome (420;520-562; Nature 2002)
Lern-/Lehrmethoden / teaching/studying methods:	lecture, exercise, presentation
Modulverantwortliche / module manager	
Vorname / First name:	Martin
Nachname Last name:	Klingenspor
MyTUM-Email:	mk@tum.de
Dozent / lecturer	
1. Dozent / lecturer	
Vorname / first name:	Martin
Nachname / last name:	Klingenspor
Institution:	Chair for Molecular Nutritional Medicine
MyTUM-Email:	mk@tum.de
2. Dozent / lecturer	
Vorname / first name:	Tobias
Nachname / last name:	Fromme
Institution:	Chair for Molecular Nutritional Medicine
MyTUM-Email:	fromme@tum.de
3. Dozent / lecturer	
Vorname / first name:	Florian
Nachname / last name:	Bolze
Institution:	Chair for Molecular Nutritional Medicine
MyTUM-Email:	bolze@tum.de
Lehrveranstaltungen / course	
1. LV / 1st course:	
Art / type:	lecture
Name / name:	Intro to Applied Bioinformatics
Semesterwochenstunden / semester periods per week:	1 SWS
2. LV / 2nd course:	
Art / type:	exercise course
Name / name:	Applied Bioinformatics
Semesterwochenstunden / semester periods per week:	2 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2nd study program:	
Name / name:	Molecular Biotechnology
3. Studiengang / 3rd study program:	
Name / name:	Biology



Module: Nutrition and Microbe-host Interactions

Allgemeine Daten / general data

Modulbezeichnung / module name:	Diet and Microbe-host Interactions
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	summer term
Sprache / language:	English
ECTS (credits):	5

Arbeitsaufwand / workload

Präsenzstunden / contact hours:	60
Eigenstudiumsstunden / self-study hours:	90
Gesamtstunden / total workload:	150

Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement

Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	60 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / oral examination:	no

Beschreibung / description

Inhalt / content:

This lecture and seminar series is meant to give deep insight into the diversity and functions of the mammalian gut microbial ecosystem (intestinal microbiota) in close interaction with the host and with dietary factors. Particular attention will be drawn onto the development of the microbiota throughout life as well as underlying cross-talk mechanisms with the mucosal immune system with a particular focus on chronic inflammatory disorders, enteric infections and metabolic disorders. Lectures will be backed up by interactive work during the seminar based on the use of up-to-date literature.

Angestrebte Lernergebnisse / learning outcomes:

At the end of the module students have gained knowledge on the role of dietary and microbial triggers in regulation host health. They are able to use this knowledge to critically assess recent findings.

Empfohlene Voraussetzungen / recommended prerequisite:	basics in microbiology and biofunctionality, basics in immunology
Medienformen / media forms:	
Literatur / literature:	Microbial Inhabitants of Humans: Their Ecology and Role in Health and Disease. Cambridge University Press, 2005, ISBN: 0 521 84158 5
Lern-/Lehrmethoden / teaching/studying methods:	lecture and seminar



Modulverantwortliche / module manager	
Vorname / first name:	Dirk
Nachname / last name:	Haller
MyTUM-Email:	dirk.haller@tum.de
Dozent / lecturer	
1. Dozent / 1 st lecturer	
Vorname / first name:	Dirk
Nachname / last name:	Haller
Institution:	Chair for Biofunctionality of Food
MyTUM-Email:	dirk.haller@tum.de
2. Dozent / 2 nd lecturer	
Vorname / first name:	Thomas
Nachname / last name:	Clavel
Institution:	Chair for Biofunctionality of Food
MyTUM-Email:	thomas.clavel@tum.de
Lehrveranstaltungen / Course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Diet and Microbe-host Interactions
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2 nd course:	
Art / type:	seminar
Name / name:	Diet and Microbe-host Interactions
Semesterwochenstunden / semester periods per week:	2 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2 nd study program:	
Name / name:	Molecular Biotechnology
3. Studiengang / 3 rd study program:	
Name / name:	Biology



Module: Energy Balance Regulation

Allgemeine Daten / general data

Modulbezeichnung / module name:	Energy Balance Regulation
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	summer term
Sprache / language:	English
ECTS (credits):	5

Arbeitsaufwand / workload

Präsenzstunden / contact hours:	60
Eigenstudiumsstunden / self-study hours:	90
Gesamtstunden / total workload:	150

Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement

Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	60 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / oral examination:	no

Beschreibung / description

Inhalt / content:	<ol style="list-style-type: none"> 1. Components of energy homeostasis 2. Physiological regulation 3. Thermoregulation 4. Biochemical mechanisms of thermogenesis 5. Gastrointestinal nutrient sensing 6. Neuroanatomy of energy balance 7. Orexigenic and anorexigenic signaling 8. Neuropeptides and transmitters 9. Nutrient sensing in the brain 10. Chronobiology and energy balance
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Angestrebte Lernergebnisse / learning outcomes:

At the end of the module students are able to understand the integrative physiology of energy balance regulation. They have gained knowledge on the relative importance of multiple components of energy homeostasis and how these are regulated in response to environmental and nutritional conditions. They can evaluate the consequences of alterations in neuronal and hormonal signals controlling food intake, energy storage and energy expenditure. They critically assess results published on energy balance regulation in animal models and humans. Students are able to identify open questions and unsolved problems in this area of nutritional biomedical research.

Empfohlene Voraussetzungen / recommended prerequisite:	knowledge in biochemistry, genetics, mammalian physiology, cell biology, and molecular biology.
Medienformen / media forms:	presentations; original research papers and reviews.



Literatur / literature:	will be announced by lecturer and tutors
Lern-/Lehrmethoden / teaching/studying methods:	lecture and seminar
Modulverantwortliche / module manager	
Vorname / first name:	Martin
Nachname / last name:	Klingenspor
MyTUM-Email:	mk@tum.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Martin
Nachname / last name:	Klingenspor
Institution:	Chair for Molecular Nutritional Medicine
MyTUM-Email:	mk@tum.de
2. Dozent / 2nd lecturer	
Vorname / first name:	Florian
Nachname / last name:	Bolze
Institution:	Chair for Molecular Nutritional Medicine
MyTUM-Email:	bolze@tum.de
3. Dozent / 3rd lecturer	
Vorname / first name:	Tobias
Nachname / last name:	Fromme
Institution:	Chair for Molecular Nutritional Medicine
MyTUM-Email:	fromme@tum.de
Lehrveranstaltungen / course	
1. LV / 1st course:	
Art / type:	lecture
Name / name:	Energy Balance Regulation
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2nd course:	
Art / type:	seminar
Name / name:	Neuroendocrinology of Energy Balance
Semesterwochenstunden / semester periods per week:	2 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2nd study program:	
Name / name:	Molecular Biotechnology
3. Studiengang / 3rd study program:	
Name / name:	Biology



6 Required modules third semester

Module: Research Internship	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Research Internship (lab course, 8 weeks)
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	12
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	300
Eigenstudiumsstunden / self-study hours:	60
Gesamtstunden / total workload:	360
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	graded internship report
Prüfungsdauer / exam duration:	
Hausaufgaben / homework:	yes
Hausarbeit / term paper:	yes
Vortrag / oral presentation:	no
Gespräch / oral examination:	yes
Beschreibung / description	
Inhalt / content:	
<p>The internship aims to improve the methodological knowledge and technical skills of the students in relation to nutrition research. This training is included in a defined research project which allows learning more on the methodological approach to answer a defined research question. The student is introduced into the techniques and supervised by experienced personal. There are regular discussions of the results. The internship is finished by writing a short report focusing on the techniques learned during the course.</p>	
Angestrebte Lernergebnisse / learning outcomes:	
<p>At the end of the module students are able to select appropriate methods for answering a research question. They will obtain practical knowledge and experience on selected methods including a critical assessment of limitations.</p>	
Medienformen / media forms:	regular discussions with scientific personal and supervisors
Literatur / literature:	selected literature
Lern-/Lehrmethoden / teaching/studying methods:	practical work, discussion with supervisor



Modulverantwortliche / module manager	
Vorname / first name:	Hans
Nachname / last name:	Hauner
MyTUM-Email:	hans.hauner@tum.de
Dozent / lecturer	
1. Dozent / 1 st lecturer	
Vorname / first name:	Hans
Nachname / last name:	Hauner
Institution:	Chair for Nutritional Medicine
MyTUM-Email:	hans.hauner@tum.de
2. Dozent / 2 nd lecturer	
Vorname / first name:	Martin
Nachname / last name:	Klingenspor
Institution:	Chair for Molecular Nutritional Medicine
MyTUM-Email:	mk@tum.de
3. Dozent / 3 rd lecturer	
Vorname / first name:	Dirk
Nachname / last name:	Haller
Institution:	Chair for Biofunctionality of Food
MyTUM-Email:	dirk.haller@tum.de
4. Dozent / 4 th lecturer	
Vorname / first name:	Hannelore
Nachname / last name:	Daniel
Institution:	Chair for Nutritional Physiology
MyTUM-Email:	hannelore.daniel@tum.de
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	practical course
Name / name:	Research Internship
Semesterwochenstunden / semester periods per week:	15 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



7 Elective modules third semester

Please note that the listing of the elective modules is subject to change. The examination committee of the Academic Faculty of Nutrition updates this list in the need and publishes the changes.

Elective modules can also be chosen from the complete supply of TUM in English as well as in German.

Module: Molecular Oncology	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Molecular Oncology
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	2 terms
Häufigkeit / term:	winter and summer term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	60
Eigenstudiumsstunden / self-study hours:	90
Gesamtstunden / total workload:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
<p>This module is composed of two courses distributed over two semesters: Molecular Oncology 1 (MolOnc 1) and Molecular Oncology 2 (MolOnc2). The lecture of MolOnc 1 has to be continuously visited (controlled) which qualifies the student for the written final exam (free questions, grades), which serves to test the knowledge and competence acquired with the help of the lectures. There are no aids allowed in the final exams. The questions can be based on any subject of the lectures or a combination thereof and demand the ability to reproduce, associate, and transfer thinking. The passing of the exam is prerequisite for allowance for MolOnc2. MolOnc2 is a problem-oriented lecture which intensifies the knowledge of MolOnc1. The course is limited to 10 participants. It can be taken in any of the subsequent semesters. In constant problem-solving activities based around an abstract of a scientific paper the capabilities of the students are constantly proven and monitored. A short talk on the results of the discussion is the second component of the final grading. It is possible that a short written exam with problem-solving activities is used as a third component of testing.</p>	
Prüfungsart / exam type:	MolOnc1: 1 written exam; MolOnc2: oral examinations (contributions to the discussion; short talk), 1 test
Prüfungsdauer / exam duration:	MolOnc1: 90 min (written exam); MolOnc2: 60 min (test)
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / oral examination:	yes



Beschreibung / description

Inhalt / content:

Features of the tumor progression (difficulties d. modern one tumor research, definitions, meaning of the tumor Microenvironments, Hallmarks of Cancer, Qualities of transformed cells in the experiment); Causes of the tumorigenesis (stem cells and tumor formation, wnt/hedgehog Self-renewal, mutations, repair, cellular answer to mutagens); Oncogenes (experiments of Rous, Rubin, Temin, Weinberg, definitions, function classes of oncogenes and examples); Tumor suppressor genes (definitions, Knudson two hit hypothesis, PTEN, Checkpoints of the cell cycle, pRB, p53, MDM2, Apoptosis); Epigenetic (definitions, histone modifications, DNA methylation, pRb, CpG Islands, Examples, experiments of Mary Hendrix); Environment of the cell (components of a tumor, tumor stroma as therapeutical target, Extra cellular matrix: Components and meaning, interactions cell/ECM, Zell-Zell contact); Mechanisms of the metastasis cascade (steps of the cascade, Angiogenesis, angiogenic switch, Invasion, cicatrization and cancer, tumor associated macrophages, epithelial mesenchymal transition, seed and soil hypothesis, role of proteases, metastatic niche; genetic markers; Metastasis models in the mouse); Proteases/proteolytic network (physiological and pathophysiological functions of proteases and protease inhibitors, regulation of proteases, splitting mechanisms, the proteolytic balance, protease families, Proteases as prognostic markers, development of synthetic protease inhibitors, clinical examinations, optimization of synthetic protease inhibitors, the cancer degradome); Specific methodology of the molecular oncology (in vivo model, biochemical/molecular proof methods of proteases and protease inhibitors, zymography, knock-out systems, siRNA, shRNAi, viral vector systems, in vitro migration and invasion models); Deepening of the mentioned areas (discussion of current publications from relevant professional journals, acquirement of a recessed understanding of the learnt mechanisms)

Angestrebte Lernergebnisse / learning outcomes:

The students will be able to understand and integrate almost every published information on modern cancer research and know the principle questions and implications addressed in upcoming publications in the field. They are also able to judge the evolution of knowledge as they get insight into the history of major discoveries in the field which is meant to boost their self-confidence as future graduate students. Specifically the students are able not only to reproduce facts but are trained to associate pieces of knowledge and transfer this to unknown problems. The students acquire knowledge of a set of experimental procedures allowing them to design relevant experiments. This, together with the problem-oriented in-depth analyses of topic-related problems will enable them to be well-prepared for job-related questions even in other research fields in the life sciences.

Empfohlene Voraussetzungen / recommended prerequisite:	Bachelor in life sciences, basics of biochemistry, molecular biology, genetics. Other modules are not a prerequisite.
Medienformen / media forms:	Topics will be developed at the blackboard with the help of power point presentations. The script is made available beforehand.
Literatur / literature:	No text books are necessary to pass the exam. Additional information can be obtained from: Cell and Molecular Biology. G. Karp. Wiley Verlag, 4. Auflage, ISBN: 0-471-65665-8 The Biology of Cancer. R. A. Weinberg. Garland Science, 1. Auflage, ISBN: 0-8153-4076-1
Lern-/Lehrmethoden / teaching/studying methods:	Talk with the development of schemes at the blackboard, relatively sparse use of PowerPoint slides. Study of the script and the notes taken, suggested follow-ups in the literature.



Modulverantwortliche / module manager	
Vorname / first name:	Achim
Nachname / last name:	Krüger
MyTUM-E-Mail:	achim.krueger@lrz.tum.de
Dozent / lecturer	
1. Dozent / 1 st lecturer	
Vorname / first name:	Achim
Nachname / last name:	Krüger
Institution:	Klinikum rechts der Isar der TUM, Institut f. Exp. Onkologie und Therapieforschung
MyTUM-E-Mail:	achim.krueger@lrz.tum.de
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Molecular Oncology I
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2 nd course:	
Art / type:	problem-oriented lecture
Name / name:	Molecular Oncology II
Semesterwochenstunden / semester periods per week:	2 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2 nd study program:	
Name / name:	Molecular Biotechnology
3. Studiengang / 3 rd study program:	
Name / name:	Biology



Module: Experimental Immunology and Pathology

Allgemeine Daten / general data

Modulbezeichnung / module name:	Experimental Immunology and Pathology
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5

Arbeitsaufwand / workload

Präsenzstunden / contact hours:	70
Eigenstudiumsstunden / self-study hours:	80
Gesamtstunden / total workload:	150

Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement

Prüfungsart / exam type:	graded internship report
Prüfungsdauer / exam duration:	no
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	no

Beschreibung / description

Inhalt / content:

This practical exercise demonstrates the use of animal models (mouse) in biomedical research. On the basis of a mouse model of chronic intestinal inflammation, a possible setup of how the impact of nutrition or food components on inflammatory processes can be investigated is shown. Disease-associated alterations are analyzed on molecular-, cellular-, microbial- and pathological levels.

Angestrebte Lernergebnisse / learning outcomes:

This lab course introduces scientific methods for working with animal (mouse) models and illustrated possibilities and limits of these technics. Students deepen their knowledge on inflammatory processes and learn to link basic immunological knowledge to physiological alterations. The practical furthermore improves laboratory working skills in preparation for the master's thesis.

Empfohlene Voraussetzungen / recommended prerequisite:	Basics of Immunology
Lern-/Lehrmethoden / teaching/studying methods:	exercise (lab) course

Modulverantwortliche / module manager

Vorname / First name:	Dirk
Nachname Last name:	Haller
MyTUM-Email:	dirk.haller@tum.de



Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Dirk
Nachname / last name:	Haller
Institution:	TUM, Chair for Biofunctionality of Food
MyTUM-Email:	dirk.haller@tum.de
2. Dozent / 2nd lecturer	
Vorname / first name:	Thomas
Nachname / last name:	Clavel
Institution:	TUM, Chair for Biofunctionality of Food
MyTUM-Email:	thomas.clavel@tum.de
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	exercise course
Name / name:	Experimental Immunology and Pathology
Semesterwochenstunden / semester periods per week:	20 SWS (5 groups à 5 SWS)
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2 nd study program:	
Name / name:	Molecular Biotechnology
3. Studiengang / 3 rd study program:	
Name / name:	Biology



Module: Pharmacology and Toxicology

Allgemeine Daten / general data

Modulbezeichnung / module name:	Pharmacology and Toxicology
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	summer term
Sprache / language:	German
ECTS (credits):	5

Arbeitsaufwand / workload

Präsenzstunden / contact hours:	50
Eigenstudiumsstunden / self-study hours:	100
Gesamtstunden / total workload:	150

Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement

Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	90 minutes
Hausaufgaben / homework:	yes
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	no

Beschreibung / description

Inhalt / content:

1. Refreshment and intensifying of pharmacodynamic and pharmacokinetic principals (bioavailability, distribution volume, clearance, half-life in application on drug interactions, chronic medication, Toxokinetics)
2. Drug development term definition, conceptualization of new drugs, screening of pharmacological as well as acute and subacute toxic effects. Deepening pharmacology on animals, potential and limits of animal studies. Potential and limits of clinical preliminary studies (phase I & II), legal framework (AMG §40-42). Confirmative therapy studies (Phase III), methods, ethics, placebo problems. Registration upon EMEA vs. BfArM, exemptions, „orphan drugs“, „compassionate use“. Therapeutical applications (PhaseIV), maintenance of products, pharmacovigilance, (cohorts- vs. case-control-studies). Drug commissions; Periodic Safety Reports, "Stufenplanverfahren".
3. Considerations in connection with drug marketing
contribution of single disease-groups and their therapy to the increase of life-span, special features of the drug-market, market development for pharmacy-only and over the counter drugs, sales of single indication groups (groups with the highest turnover: ulcusterapy, antihypertensives, pain killers and anti-inflammatory drugs, diabetes drugs)
4. Antihypertensives epidemiology und pathophysiology, graded therapy indications. Diuretics (thiazides, loop diuretics, potassium-sparing diuretics) with drug profiles and differential indication. ACE-inhibitors, AT₁-receptor antagonists, β-blockers and calcium channel blocker, in each case with drug profile, other indications (e.g. Angina Pectoris – epidemiology and pathomechanisms). Comparing therapy studies, differential indication e.g. EPH-gestosis and malignant hypertension (Diazoxide, Hydralazine).
5. Analgetics
Epidemiology and the nociceptive system. Opiates with profiles (indications, effect mechanisms, side effects, addiction potential, antidotes) small analgetics & anti-inflammatory drugs. Pathophysiology



and effect mechanism of the COX-inhibitors. Differential therapy with p-aminophenols, pyrazolon derivatives, acidantiphlogistica, with side effects and intoxications (here: Intensifying metabolism and non-linear kinetics). COX2-Inhibitors, Rofecoxib, here: deepening: maintenance of the product after admission. Gout: epidemiology, pathomechanisms. Allopurinol, Uricosurica, Colchicine

6. Diabetes therapy: long-term complications and control possibilities, Insulin as a drug (Lyspro- und Glagin Insulin, other depot forms) with profiles, Sulfonylhurea (profile, polymorphism), biguanides, Glitazone, glucosidase inhibitors (profile and differential indications).

7. Toxicology healthy consumer protection, Risk assessment, regulatory dealing, prevention principles, chemistry law (targets, Toxicity testing, R-Sentences), Lebensmittel und Futtermittelgesetzbuch und verbundene Verordnungen, Bundesimmissionsschutzgesetz, Prinzipien der Prüfung für die Zulassung von Chemikalien bei einmaliger und wiederholter Exposition, Biozide, Prüfung auf Genotoxizität, Embryotoxizität, Reproduktionstoxizität, Risikobewertung, acceptable daily intake, Expositionsabschätzung

Angestrebte Lernergebnisse / learning outcomes:

- at the end of this course, students have to be able to
- evaluate central questions linking between pharmacology and the commercial interests
 - apply the basic ideas and problems as well as the legal framework for the development of drugs
 - analyze questions of the benefit/risk consideration in the choice of a drug for the therapy of a disease on the basis of pharmacokinetic, pharmacodynamic, toxicologic and disease-associated connections
 - understand and apply legal framework guidelines of examination, admission and the handling with potential toxic substances

Empfohlene Voraussetzungen / recommended prerequisite:

the lecture "Pharmakologie und Toxikologie" of the bachelor studies "Ernährungswissenschaft" is desired

Literatur / literature:

Pharmakologie und Toxikologie. Lüllmann, Mohr, Wehling, 15. Auflage, Thieme, 2003, ISBN:3-13-368515-5
Allgemeine Toxikologie. Markwardt Schäfer

Modulverantwortliche / module manager

Vorname / first name:	Klaus
Nachname / last name:	Schümann
MyTUM-Email:	k.schuemann@lrz.uni-muenchen.de

Dozent / lecturer

1. Dozent / 1st lecturer

Vorname / first name:	Klaus
Nachname / last name:	Schümann
Institution:	TUM
MyTUM-Email:	k.schuemann@lrz.uni-muenchen.de

Lehrveranstaltungen / course

1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Pharmacology and Toxicology
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2 nd course:	
Art / type:	seminar
Name / name:	Pharmacology and Toxicology
Semesterwochenstunden / semester periods per week:	1 SWS



Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2 nd study program:	
Name / name:	Molecular Biotechnology
3. Studiengang / 3 rd study program:	
Name / name:	Biology



Module: Food Design and Food Industry

Allgemeine Daten / general data

Modulbezeichnung / module name:	Food Design and Food Industry
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	2 terms
Häufigkeit / term:	winter and summer term
Sprache / language:	English
ECTS (credits):	5

Arbeitsaufwand / workload

Präsenzstunden / contact hours:	30
Eigenstudiumsstunden / self-study hours:	60
Gesamtstunden / total workload:	90

Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement

Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	60 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	no

Beschreibung / description

Inhalt / content:

- Methods for product development of the food industry (from conception to production):
- the consumer as the driving force
 - product optimization regarding to taste, appearance, cost, etc.
 - composition of nutritionally important
 - the food industry as an important social factor
 - major employers
 - factors for primary care of the population
 - connection between agriculture and consumers
 - brand strategies and challenges

Angestrebte Lernergebnisse / learning outcomes:

At the end of this course the students are able to understand the role of the food industry and they are able to evaluate the population supply with safe, cheap and healthy food.

Empfohlene Voraussetzungen / recommended prerequisite:	none
Medienform / media form:	presentation



Modulverantwortliche / module manager	
Vorname / first name:	Gerd
Nachname / last name:	Harzer
MyTUM-Email:	gu56deh@mytum.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Gerd
Nachname / last name:	Harzer
Institution:	
MyTUM-Email:	gu56deh@mytum.de
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Food Design
Semesterwochenstunden / semester periods per week:	1,5 SWS
2. LV / 2 nd course:	
Art / type:	lecture
Name / name:	Food Industry
Semesterwochenstunden / semester periods per week:	1,5 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



Module: Applied Food Law	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Applied Food Law
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	2 terms
Häufigkeit / term:	winter and summer term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	60
Eigenstudiumsstunden / self-study hours:	90
Gesamtstunden / total workload:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	oral exam
Prüfungsdauer / exam duration:	20 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	yes
Beschreibung / description	
Inhalt / content:	
Law of the EU: Principles, general food law, jurisdiction, categories of products, use of substances, food safety, novel food, gmo, labeling, consumer information, responsibility, advertising, health and nutrition claims. Independent working with law texts, understanding of the principles of food law	
Angestrebte Lernergebnisse / learning outcomes:	
At the end of the module students are able to understand the principles of food law and they are able to judge the use of ingredients in and the advertising for foodstuffs.	
Empfohlene Voraussetzungen / recommended prerequisite:	Food law lecture in B.Sc. study recommended, but no prerequisite
Medienformen / media forms:	presentation
Lern-/Lehrmethoden / teaching/studying methods:	lecture
Modulverantwortliche / module manager	
Vorname / first name:	Andreas
Nachname / last name:	Meisterernst
MyTUM-Email:	-



Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Andreas
Nachname / last name:	Meisterernst
Institution:	Meisterernst Rechtsanwälte
MyTUM-Email:	
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Applied Food Law
Semesterwochenstunden / semester periods per week:	4 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



Module: Public Health Nutrition	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Public Health Nutrition
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	50
Eigenstudiumsstunden / self-study hours:	100
Gesamtstunden / total workload:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	60 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / oral examination:	no
Beschreibung / description	
<p>Inhalt / content:</p> <ul style="list-style-type: none"> - basics, inclusive epidemiological methods, dimensions, study designs, fieldwork, elevation methods and quality of nutrition data; - descriptive epidemiology (nutrition, lifestyle factors and nutritional disease) - risk factor concept, incl. statistical concepts - quality and use of nutritional biomarkers and intermediary markers (dose-effect, validity, reproducibility etc.) - Inclusion of genetic data and other omics data- - ethical aspects of the use of data and biological tests (incl. bio banking) - preventative nutrition: Evidence finding and derivation of recommendations - programs to the nutritional health support - secondary and tertiary prevention with nutrition facts <p>seminar: discussion of selected aspects from the field of Public Health and Nutrition by using primary literature and regular measures for the health support</p>	
<p>Angestrebte Lernergebnisse / learning outcomes:</p> <p>At the end of the module students are able:</p> <ul style="list-style-type: none"> - to describe epidemiological methods of nutrition situation and distribution of illnesses in context of the population - to understand original lecture and to evaluate the results of epidemiological studies - to create appropriate studies - to use nutrition data and “biomarkers data” in analytical research - to know possibilities and limits of the intervention in the population / in high risk groups 	



Empfohlene Voraussetzungen / recommended prerequisite:	
Medienformen / media forms:	lecture: presentation; handout of presentations; original literature; discussion seminar: refurbishing of the topics using original literature; presentation of the results; discussion
Literatur / literature:	Müller MJ und Trautwein EA: Gesundheit und Ernährung - Public Health Nutrition. Verlag Eugen Ulmer, Stuttgart, 2005. Willett W: Nutritional Epidemiology, 2nd Ed., Oxford University Press, 2006. Wild C: Molecular Epidemiology of Chronic Diseases. Wiley & Sons, 2008.
Lern-/Lehrmethoden / teaching/studying methods:	lecture (2 SWS), seminar (1 SWS)
Modulverantwortliche / module manager	
Vorname / first name:	Jakob
Nachname / last name:	Linseisen
MyTUM-Email:	j.linseisen@helmholtz-muenchen.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Jakob
Nachname / last name:	Linseisen
Institution:	
MyTUM-Email:	j.linseisen@helmholtz-muenchen.de
Lehrveranstaltungen / course	
1. LV / 1st course:	
Art / type:	lecture
Name / name:	Public Health Nutrition
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2nd course:	
Art / type:	seminar
Name / name:	Public Health Nutrition
Semesterwochenstunden / semester periods per week:	1 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1st study program:	
Name / name:	Nutrition and Biomedicine



Module: Molecular Sensory Properties	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Molecular Sensory Properties
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	50
Eigenstudiumsstunden / self-study hours:	100
Gesamtstunden / total workload:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	90 minutes
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	no
Beschreibung / description	
<p>Inhalt / content:</p> <ul style="list-style-type: none"> • physiology and biochemistry of the olfactory perception (functionality of the sense of smell, structure and function of the olfactory system and its central interconnections, olfactory receptors, odor coding, olfactory discrimination and its neurophysiological basics) • physiology and biochemistry of the perception of taste (morphology of taste organs and its connections, qualities of taste and signal processing, molecular mechanisms of taste recognition, receptors, agonists, antagonists, polymorphisms, taste coding, adaption) • structures and sensory activity of selected odors and flavorings in food • modern methods of aroma production • aroma release-systems and techniques of aroma-encapsulating • legal basics of the use of aroma 	
<p>Angestrebte Lernergebnisse / learning outcomes:</p> <p>At the end of this course, students are able to:</p> <ul style="list-style-type: none"> • recognize central questions in the physiology of odor and taste, especially the relations between structure and effect of sensory active substances, to create topic-based questions and to answer themselves legal questions • work on problem-based Solutions • apply knowledge about structure and sensory activity of odors and flavorings • apply the acquired knowledge on intensified questions 	
Empfohlene Voraussetzungen / recommended prerequisite:	no special requirements



Literatur / literature:	Lehrbuch der Lebensmittelchemie. Belitz, Hans-Dieter; Grosch, Werner; Schieberle, Peter; ISBN: 978354041096-6 Physiologie des Menschen. Schmidt, Lang, Thews, Springer Verlag, 29. Auflage, ISBN: 978-3-540-21882-1
Lern-/Lehrmethoden / teaching/studying methods:	lecture
Modulverantwortliche / module manager	
Vorname / first name:	Thomas
Nachname / last name:	Hofmann
MyTUM-Email:	thomas.hofmann@wzw.tum.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Andreas
Nachname / last name:	Dunkel
Institution:	Lehrstuhl für Lebensmittelchemie und molekulare Sensorik
MyTUM-Email:	andreas.dunkel@tum.de
Lehrveranstaltungen / course	
1. LV / 1st course:	
Art / type:	lecture
Name / name:	Molecular Sensory Properties
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2nd course:	
Art / type:	seminar
Name / name:	Molecular Sensory Properties
Semesterwochenstunden / semester periods per week:	1 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1st study program:	
Name / name:	Nutrition and Biomedicine



Module: Sports and Nutrition	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Sports and Nutrition
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	German
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	50
Eigenstudiumsstunden / self-study hours:	100
Gesamtstunden / total workload:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	60 minutes
Hausaufgaben / homework:	yes
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / oral examination:	no
Beschreibung / description	
Inhalt / content:	
<p>Energy supply and energy consumption. Nutrient requirement as a function of the extent and intensity of physical activity. Specific nutrients to optimize recovery after intense stress. Thermoregulation and water balance. Performance-enhancing substances and methods. Fundamentals of general practice teaching. General dietary recommendations for athletes. Assessment of industrial sports nutrition products and presentation of alternative possibilities</p>	
Angestrebte Lernergebnisse / learning outcomes:	
<p>At the end of this course students are able to advice athletes of various disciplines and performance levels in nutrition and to create variable diet plans (taking into account the seasonal course of the preparation period and competition dates).</p>	
Medienformen / media forms:	presentation (handouts)
Lern-/Lehrmethoden / teaching/studying methods:	lecture, seminar
Modulverantwortliche / module manager	
Vorname / first name:	Klaus-Jürgen
Nachname / last name:	Moch
MyTUM-Email:	kjmoch@t-online.de



Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Klaus-Jürgen
Nachname / last name:	Moch
Institution:	
MyTUM-Email:	kjmocho@t-online.de
2. Dozent / 2nd lecturer	
Vorname / first name:	Olaf
Nachname / last name:	Hülsmann
Institution:	
MyTUM-Email:	-
Lehrveranstaltungen / course	
1. LV / 1st course:	
Art / type:	lecture
Name / name:	Sports and Nutrition
Semesterwochenstunden / semester periods per week:	2 SWS (as block at two weekends)
2. LV / 2nd course:	
Art / type:	seminar
Name / name:	Sports and Nutrition
Semesterwochenstunden / semester periods per week:	1 SWS (as block at two weekends)
Zuordnung / assignment curriculum	
1. Studiengang / 1st study program:	
Name / name:	Nutrition and Biomedicine



Module: Nutrition of Selected Groups	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Nutrition of Selected Groups
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	50
Eigenstudiumsstunden / self-study hours:	100
Gesamtstunden / total workload:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	written exam
Prüfungsdauer / exam duration:	60 minutes
Hausaufgaben / homework:	yes
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / oral examination:	no
Beschreibung / description	
Inhalt / content:	
Life Cycle nutrition, nutrition and exercises, and occupation, nutrient changes by preparation of food and communal feeding, nutrition and religion, problems in communal feeding respectively migration, alternative nutrition.	
Angestrebte Lernergebnisse / learning outcomes:	
The students are able to understand the specific nutritional problems in different phases of life, including specific pathophysiological knowledge. They are able to analyze and evaluate the literature respectively these problems and to analyze these problems from the Public Health point of view. The approach to scientific literature from the field of public health nutrition is applied. The students attend to a subject with new literature and present it to the colleagues.	
Medienformen / media forms:	presentation, handouts
Literatur / literature:	Journal: Eur J clin Nutr; Sports Med; Pediatrics; Am j Clin nutr; JAMA, C.Küpper: Ernährung älterer Menschen, Umschau; MH Williams: Nutrition, Fitness, Sport, U&S
Lern-/Lehrmethoden / teaching/studying methods:	lecture, seminar



Modulverantwortliche / module manager	
Vorname / first name:	Susanne
Nachname / last name:	Hailer
MyTUM-E-Mail:	hailer@wzw.tum.de
Dozent / lecturer	
1. Dozent / 1 st lecturer	
Vorname / first name:	Susanne
Nachname / last name:	Hailer
Institution:	TUM
MyTUM-E-Mail:	hailer@wzw.tum.de
Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Nutrition of Selected Groups
Semesterwochenstunden / semester periods per week:	2 SWS
2. LV / 2 nd course:	
Art / Type:	seminar
Name / name:	Nutrition of Selected Groups
Semesterwochenstunden / semester periods per week:	1 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



Module: Mitochondrial Biology	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Mitochondrial Biology
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	60
Eigenstudiumsstunden / self-study hours:	90
Gesamtstunden / all of the hours:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	oral examination
Prüfungsdauer / exam duration (min):	20
Hausaufgaben / homework:	no
Hausarbeit / term paper:	no
Vortrag / oral presentation:	yes
Gespräch / conversation:	no
Beschreibung / description	
Inhalt / content:	
<p>The course covers the entire spectrum of mitochondrial involvement in cellular homeostasis and metabolism. This includes oxidative phosphorylation, membrane potential, thermogenesis, anaplerotic reactions, apoptosis, calcium homeostasis, reactive oxygen species, mtDNA and mitochondrial transcription/translation, mtDNA mutations in disease and the phylogeny of human origin, evolution and the endosymbiotic theory, fusion and fission, protein import, solute transport, mito-ER association and iron/heme metabolism. Basic knowledge will be provided in the form of lectures. The corresponding seminar will allow students to both practice their presentation skills of original literature and convey highlights of current research in the above fields.</p>	
Angestrebte Lernergebnisse / learning outcomes:	
<p>This course will broaden the perspective on mitochondria from mere ATP producers to their complex role as integrative hubs in multiple metabolic and signaling pathways. Students will be able to understand and integrate recent and future literature into this complete framework of mitochondrial function.</p>	
(Empfohlene) Voraussetzungen / recommended prerequisite:	Basics in Nutrition and Food, Energy Balance Regulation
Medienformen / media forms:	presentation slides, whiteboard



Literatur / literature:	
Lern-/Lehrmethoden / teaching/studying methods:	Lecture (2 SWS), seminar (2 SWS)
Modulverantwortliche / module manager	
Vorname / first name:	Tobias
Nachname / last name:	Fromme
MyTUM-Email:	fromme@tum.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Tobias
Nachname / last name:	Fromme
Institution:	Chair for Molecular Nutritional Medicine
MyTUM-Email:	fromme@tum.de
Lehrveranstaltungen / Course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Mitochondrial Biology
Semesterwochenstunden / weekly hours per term:	2 SWS
2. LV / 2 nd course:	
Art / type:	seminar
Name / name:	Mitochondrial Biology
Semesterwochenstunden / weekly hours per term:	2 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2 nd study program:	
Name / name:	
3. Studiengang / 3 rd study program:	
Name / name:	



Module: Design and Analysis of Experiments

Allgemeine Daten / general data

Modulbezeichnung / module name:	Design and Analysis of Experiments
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5

Arbeitsaufwand / workload

Präsenzstunden / contact hours:	55
Eigenstudiumsstunden / self-study hours:	95
Gesamtstunden / all of the hours:	150

Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement

Prüfungsart / exam type:	oral exam
Prüfungsdauer / exam duration (min):	30 min per 2 candidates
Hausaufgaben / homework:	yes
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / conversation:	no

Beschreibung / description

Inhalt / content:

Design of experiments: principles, randomisation, statistical power and sample sizes, completely randomized designs, block designs, factorial designs, nested designs;
 Design of human studies;
 Analysis of variance: prerequisites, analysis of residuals, contrasts, generalised linear model, repeated measurements, mixed effect models, nonparametric alternatives;
 Correlations: Pearson, Spearman, Kendall, partial correlation, correlation networks;
 Cluster analysis;
 Principal component analysis;
 Survival analysis;

Angestrebte Lernergebnisse / learning outcomes:

At the end of the module students are able to design experiments in accordance to predefined scientific problems, to understand pros and cons of various experimental concepts, and to analyse respective experimental data using suitable statistical methods. Based on numerous examples the students are enabled to apply these methods using the software R and to interpret the obtained output in a correct manner.

(Empfohlene) Voraussetzungen / recommended prerequisite:

basics in epidemiology, public health and statistics

Medienformen / media forms:

presentations, script, case studies, PC exercises



Literatur / literature:	<p>Crawley MJ (2012): The R Book. 2nd Ed. New Jersey : Wiley</p> <p>Griesbrecht FG, Gumpertz ML (2004): Planning, Constructing, and Statistical Analysis of Comparative Experiments. New Jersey : Wiley</p> <p>Heiberger RM, Holland B (2004): Statistical Analysis and Data Display – An Intermediate Course with Examples in S-Plus, R, and SAS. New York : Springer</p> <p>Hoshmand AR (2006): Design of Experiments for Agriculture and the Natural Sciences. 2nd Ed. Boca Raton etc. : Chapman & Hall</p>
Lern-/Lehrmethoden / teaching/studying methods:	lecture, presentation, exercises
Modulverantwortliche / module manager	
Vorname / first name:	Kurt
Nachname / last name:	Gedrich
MyTUM-Email:	KGedrich@tum.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Kurt
Nachname / last name:	Gedrich
Institution:	Chair for Nutritional Physiology
MyTUM-Email:	KGedrich@tum.de
Lehrveranstaltungen / Course	
1. LV / 1st course:	
Art / type:	PC exercise
Name / name:	Introduction to R
Semesterwochenstunden / weekly hours per term:	1 SWS
2. LV / 2nd course:	
Art / type:	lecture
Name / name:	Design and Analysis of Experiments
Semesterwochenstunden / weekly hours per term:	2 SWS
3. LV / 3rd course:	
Art / type:	practical training
Name / name:	Design and Analysis of Experiments
Semesterwochenstunden / weekly hours per term:	1 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2nd study program:	
Name / name:	
3. Studiengang / 3rd study program:	
Name / name:	



Module: Health Behaviour and Health Promotion	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Health Behaviour and Health Promotion
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	50
Eigenstudiumsstunden / self-study hours:	100
Gesamtstunden / all of the hours:	150
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	oral exam
Prüfungsdauer / exam duration (min):	30 min per 2 candidates
Hausaufgaben / homework:	no
Hausarbeit / term paper:	yes
Vortrag / oral presentation:	yes
Gespräch / conversation:	no
Beschreibung / description	
Inhalt / content:	
<p>Health Psychology: Approaches; Models of health, health behaviour and health education/ counseling/ promotion; Risk behaviour and intervention;</p> <p>Economics of Health and Health Care: Economising of health; Cost-benefit analysis; Health care demand; Health insurance;</p> <p>Health Policy: Targets; Stakeholders; Health care systems; Public Health Policy of the European Union;</p> <p>Prevention and Health Promotion: Approaches: behaviour vs. setting; Evaluation strategies; Examples of successful strategies in prevention and health promotion;</p>	
Angestrebte Lernergebnisse / learning outcomes:	
<p>At the end of the module students are able to understand consumers' health behaviour, to understand pros and cons of various health systems, to evaluate given strategies and programmes of health promotion and to design potentially successful health promotion concepts.</p>	
(Empfohlene) Voraussetzungen / recommended prerequisite:	basics in epidemiology, public health and statistics
Medienformen / media forms:	presentations, script, case studies



Literatur / literature:	Bartholomew LK et al. (2006): Planning Health Promotion Programs. 2nd ed. Jossey-Bass; Dunn DS (2009): Research Methods for Social Psychology. Wiley-Blackwell; Folland S, Goodman AC, Stano M (2001): Economics of Health and Health Care. 3rd ed. Prentice-Hall; Naidoo J, Wills J (2009): Foundations Health Promotion: Foundations for Practice. 3rd ed. Baillière Tindall (Elsevier); Taylor SE (2003): Health Psychology. 5th ed. McGraw-Hill;
Lern-/Lehrmethoden / teaching/studying methods:	lecture, seminar, paper writing, presentation
Modulverantwortliche / module manager	
Vorname / first name:	Kurt
Nachname / last name:	Gedrich
MyTUM-Email:	KGedrich@tum.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Kurt
Nachname / last name:	Gedrich
Institution:	Chair for Nutritional Physiology
MyTUM-Email:	KGedrich@tum.de
Lehrveranstaltungen / Course	
1. LV / 1 st course:	
Art / type:	lecture
Name / name:	Health Behaviour
Semesterwochenstunden / weekly hours per term:	2 SWS
2. LV / 2 nd course:	
Art / type:	seminar
Name / name:	Health Promotion
Semesterwochenstunden / weekly hours per term:	1 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine
2. Studiengang / 2 nd study program:	
Name / name:	
3. Studiengang / 3 rd study program:	
Name / name:	



Module: InDisNet: The Interdisciplinary Network

Allgemeine Daten / general data

Modulbezeichnung / module name:	InDisNet: The Interdisciplinary Network
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	winter term
Sprache / language:	English
ECTS (credits):	5

Arbeitsaufwand / workload

Präsenzstunden / contact hours:	42
Eigenstudiumsstunden / self-study hours:	80
Gesamtstunden / total workload:	124

Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement

Prüfungsart / exam type:	Presentation and final report
Prüfungsdauer / exam duration:	45 minutes oral presentation
Hausaufgaben / homework:	no
Hausarbeit / term paper:	yes
Vortrag / oral presentation:	yes
Gespräch / oral examination:	no

Beschreibung / description

Inhalt / content:

The Interdisciplinary course arises from an initiative of three lecturers in context of the ProLehre Multiplier Program for excellent teaching at TUM. The course aims at teaching the principles of scientific working in an interdisciplinary environment by applying scientific methods to practical problems, and disseminating the results. In particular, students will work as inter-faculty teams on one project in tune with up-to-date research activities and with their academic background. Together, they will be responsible for all project management issues and tasks necessary to provide answers to the main scientific question addressed in their respective projects. By means of different methodological approaches and intensive mentoring by the three seminar leaders, students will be confronted with new learning strategies and will have the opportunity to get insights into aspects of sciences from other disciplines. Thereby, they will be asked to go beyond their own area of expertise and be able to work with students from other study faculties. The students will tackle issues related to project and time management, literature survey and experimental and prototypical work in the field of microbiology, nutrition, molecular biology and informatics as well as marketing.

The course is in general organised into three workshops where the groups will be introduced to (1) the setting and the project to be completed along the course, (2) the principles of scientific working aligned to the context of the project, and finally (3) present the project results to the other groups. Between the workshops, three advisors of the participating faculties will support the students in their project. Those projects have their setting within the inter-disciplinary context of the seminar aforementioned and they constitute the prototypical implementation of applications in the field of personalized and healthy nutrition.

These projects are aligned with current ongoing work in the frame of research activities coordinated at TUM by Prof. Hannelore Daniel (www.food4me.org/de) and are thus embedded within a thematic area with promising future perspectives.



Angestrebte Lernergebnisse / learning outcomes:

Students will learn to exchange ideas in clear and concise manner with peers from other subject areas, which is essential for interdisciplinary work. Students will be in charge of the success of their team and the final results, and, very importantly, will learn how to evaluate peers. Next to these aspects, soft skills such as oral and poster presentation, questioning in congress atmosphere and pitching will also be addressed within InDisNet. For the students of the degree program Molecular Biotechnology, Nutritional Sciences, Renewable Resources, and Informatics, the seminar is a unique chance to carry out exciting inter-disciplinary projects in step with actual practice in current research to learn:

- the principles of interdisciplinary working and cooperation
- soft skills necessary for team communication, self management and team work, and presentation of project results

Empfohlene Voraussetzungen / recommended prerequisite:	Being motivated, open-minded and having an interest in practical problem solving via scientific methods.
Medienform / media form:	Presentations and handout material as a preparation to the project as well as the material necessary to work on the projects.
Literatur / literature:	Basic literature on the methods applied in context of the projects.
Lern-/Lehrmethoden / teaching/studying methods:	Seminars, short lectures and laboratory work as appropriate.

Modulverantwortliche / module manager

Vorname / first name:	Thomas
Nachname / last name:	Clavel
MyTUM-Email:	thomas.clavel@tum.de
Dozent / lecturer	
1. Dozent / 1st lecturer	
Vorname / first name:	Daniel
Nachname / last name:	Mendez Fernandez
MyTUM-Email:	mendezfe@in.tum.de
2. Dozent / 2nd lecturer	
Vorname / first name:	Thomas
Nachname / last name:	Clavel
MyTUM-Email:	thomas.clavel@tum.de
3. Dozent / 3rd lecturer	
Vorname / first name:	Jochen
Nachname / last name:	Schmid
MyTUM-Email:	jochen.schmid@mytum.de



Lehrveranstaltungen / course	
1. LV / 1 st course:	
Art / type:	seminar
Name / name:	InDisNet: The Interdisciplinary Network
Semesterwochenstunden / semester periods per week:	3 SWS
Zuordnung / assignment curriculum	
1. Studiengang / 1 st study program:	
Name / name:	Nutrition and Biomedicine



8 Master's Thesis fourth semester

Module: Master's Thesis	
Allgemeine Daten / general data	
Modulbezeichnung / module name:	Master's Thesis
Modulniveau / module standard:	M.Sc.
Semesterdauer / semester duration:	1 term
Häufigkeit / term:	summer term
Sprache / language:	English
ECTS (credits):	30
Arbeitsaufwand / workload	
Präsenzstunden / contact hours:	0
Eigenstudiumsstunden / self-study hours:	900
Gesamtstunden / total workload:	900
Studien-/Prüfungsleistungen / pass/fail credit requirement and credit requirement	
Prüfungsart / exam type:	Master's Thesis
Prüfungsdauer / exam duration:	-
Hausaufgaben / homework:	yes
Hausarbeit / term paper:	no
Vortrag / oral presentation:	no
Gespräch / oral examination:	yes
Beschreibung / description	
Inhalt / content:	
<p>Editing an autonomous research topic (the actual contents of the thesis will depend on the particular task by the supervisor); literature research; writing academic texts, experimental design, establishing a work plan, learning the subject-specific methodology, documentation and evaluation of data, assessment and critical discussion of results in comparison to scientific publications.</p>	
Angestrebte Lernergebnisse / learning outcomes:	
<p>Students will be able to edit independently defined questions with appropriate scientific techniques based on their scientific knowledge within a period of 6 months. They are able to process and to present scientific problems on their own and to plan and conduct experiments. The students know the most important publications and theories of their field of work. They are able to master the rules of scientific practice.</p>	
Modulverantwortliche / module manager	
Vorname / first name:	examination by an authorized member of the TUM
Nachname / last name:	
MyTUM-Email:	



Zuordnung / assignment curriculum

1. Studiengang / 1st study program:

Name / name:

Nutrition and Biomedicine