Subdivided Module Catalogue
for the Subject

Food Chemistry
as a Master’s with 1 major
with the degree "Master of Science"
(120 ECTS credits)

Examination regulations version: 2016
Responsible: Faculty of Chemistry and Pharmacy
Responsible: Institute of Pharmacy and Food Chemistry
Course of Studies - Contents and Objectives

The intended aims and learning outcomes of the programme have been defined to meet the requirements of the Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (regulations for the training and examination of state-examined food chemists, APOLmCh).

Graduates from the Food Chemistry programme leading to the degree of Master of Science (MSc, 120 ECTS credits) are permitted to use the job title ‘Lebensmittelchemiker’/’Lebensmittelchemikerin’.

The programme is offered as a research-based course that gives students the opportunity to deepen their theoretical and practical knowledge about the chemistry, analysis and technology of foods, cosmetics, consumer goods and feeds as well as their knowledge and skills in the areas of food law, biochemistry, toxicology and environmental analysis (topics covered in part 2 of the state examination according to Section 18 (1) to (3) APOLmCh in conjunction with Appendix 3 to the APOLmCh).

In addition, the programme equips students with the ability to develop and validate methods.

In their Master’s thesis, students solve a complex issue in food chemistry, applying the knowledge and skills they have developed throughout the programme.

Graduates from the Master’s programme in Food Chemistry are able to select, from a matrix such as foods, cosmetics, consumer goods or feeds, the criteria that are relevant to solving a scientific problem, e.g. a problem relating to the identity, quality and safety of foods, and to evaluate that problem on the basis of the valid results of the analyses performed by them.

If necessary, they are able to develop and validate the instrumental as well as cell and molecular biological, quantitative methods needed for that purpose.

The knowledge and skills described above are equivalent to the knowledge and skills to be demonstrated in part 2 of the state examination for food chemists. Graduates who possess that knowledge and those skills qualify for admission to part 3 of the state examination.
Abbreviations used

Course types: E = field trip, K = colloquium, O = conversatorium, P = placement/lab course, R = project, S = seminar, T = tutorial, Ü = exercise, V = lecture

Term: SS = summer semester, WS = winter semester

Methods of grading: NUM = numerical grade, B/NB = (not) successfully completed

Regulations: (L)ASPO = general academic and examination regulations (for teaching-degree programmes), FSB = subject-specific provisions, SFB = list of modules

Other: A = thesis, LV = course(s), PL = assessment(s), TN = participants, VL = prerequisite(s)

Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with

the general regulations governing the degree subject described in this module catalogue:

ASPO2015

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

02-Mar-2016 (2016-46)
25-Oct-2017 (2017-65)

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.
The subject is divided into

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<td>Technology of Foodstuffs including water for human use, Cosmetics, Commodities, Tobacco Products, and Animal Feed</td>
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<td>Institute of Pharmacy and Food Chemistry</td>
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<td>1 semester</td>
<td>graduate</td>
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**Contents**

Presentation of the findings from the students' thesis projects.

**Intended learning outcomes**

Students are able to deliver a presentation on their research findings as well as to discuss them.

**Courses** (type, number of weekly contact hours, language — if other than German)

K (0)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

final colloquium (approx. 30 minutes) Talk (approx. 15 minutes) with subsequent discussion (approx. 15 minutes)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
**Module title**  
Current Research in Food Chemistry

**Abbreviation**  
o8-LMC-LMCF-161-m01

**Module coordinator**  
holder of the Chair of Food Chemistry

**Module offered by**  
Institute of Pharmacy and Food Chemistry

**ECTS**  
15

**Method of grading**  
Only after succ. compl. of module(s)

**Duration**  
1 semester

**Module level**  
graduate

**Other prerequisites**  
--

### Contents

Working with the food chemistry literature and databases, discussion of recent research findings and current methods in food chemistry, solution of research problems, statistical analysis of data, presentation of research findings.

### Intended learning outcomes

Students have developed the ability to find literature about a particular research problem, perform experiments to solve that problem, prepare an account of their work and deliver a presentation on their findings.

### Courses (type, number of weekly contact hours, language — if other than German)

S (1) + Ü (1) + P (17)

### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

lab course assessment components: Vortestate and Nachtestate (pre and post-experiment exams, approx. 15 minutes), assessment and documentation of practical assignments (approx. 10 pages) and written report (approx. 5 to 10 pages)  
Language of assessment: German or English

### Allocation of places

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### Additional information

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### Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module title | Abbreviation
--- | ---
Nutritional Biochemistry | 08-LMC-BCdE1-161-m01

Module coordinator | Module offered by
holder of the Chair of Food Chemistry | Institute of Pharmacy and Food Chemistry

ECTS | Method of grading | Only after succ. compl. of module(s)
--- | --- | ---
7 | numerical grade | --

Duration | Module level | Other prerequisites
--- | --- | ---
2 semester | graduate | --

Contents
Quantitative and qualitative aspects of nutrition, e.g. energy balance, basal metabolic rate, the gross and metabolisable energy of the three main nutrients, biological value; fundamental principles of dietetics and special diets; functions of the main organs; fundamental principles of digestion, absorption and excretion as well as of the biosynthesis and metabolism of food constituents; interactions in intermediary metabolism; principles of metabolic regulation and hormonal regulation; mineral metabolism; nutrition and vitamins.

Intended learning outcomes
Students know how the relevant micro and macronutrients are transported through the human body. They have developed an understanding of the biochemical processing of nutrients in the cells and of the regulatory mechanisms of metabolic pathways.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + V (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes total)
Language of assessment: German or English

Allocation of places
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Additional information
Pursuant to Section 20 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 3. of Annex 3 of APOLmCh and Section 20 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 2. Letter e of Annex 1 of APOLmCh.

Referred to in LPO I (examination regulations for teaching-degree programmes)
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<td>1 semester</td>
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**Contents**

Assessment of foods on the basis of applicable food law.

**Intended learning outcomes**

Students are able to assess foods on the basis of applicable food law.

**Courses** (type, number of weekly contact hours, language — if other than German)

| Ü (0) |

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written report (approx. 5 pages)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Special Food and Animal Feed | 08-LMC-SpezLM-161-m01

Module coordinator | Module offered by
holder of the Chair of Food Chemistry | Institute of Pharmacy and Food Chemistry

ECTS | Method of grading | Only after succ. compl. of module(s)
---|---|---
6 | numerical grade | --

Duration | Module level | Other prerequisites
---|---|---
1 semester | graduate | --

Contents
Chemical constituents, production and analysis of particular foods and feeds, chemical changes caused in those foods and feeds during processing, storage and transportation as well as pharmacological and toxicological effects of their normal and abnormal constituents.

Intended learning outcomes
Students are familiar with the chemistry and analysis of functional foods and feeds as well as foods/feeds containing genetically modified organisms. They know methods for the analysis of cosmetics, consumer goods and tobacco products, the relevant legal provisions as well as constituents that have pharmacological and toxicological effects. They have developed a thorough knowledge of the chemistry of food constituents and methods for the analysis of particular foods and feeds including the interpretation of measured data with statistical methods.

Courses (type, number of weekly contact hours, language — if other than German)
V (1) + V (1) + S (1) + S (1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes total)
Language of assessment: German or English

Allocation of places
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Additional information
Pursuant to Section 18 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 1. of Annex 3 of APOLmCh and Section 18 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 1. Letter a and No. II 2. Letter a of Annex 1 of APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 2. Letters c and d of Annex 1 of APOLmCh.

Referred to in LPO I (examination regulations for teaching-degree programmes)
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**Contents**

The module offers the opportunity to learn correct presenting and mediating scientific questions by giving a tutorial attendant to a lecture at the faculty of chemistry and pharmacy.

**Intended learning outcomes**

The students are able to adequately prepare and present scientific questions, and to guide students in lower semesters.

**Courses** *(type, number of weekly contact hours, language — if other than German)*

| T (3) |

**Method of assessment** *(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)*

Tutoring activities, (preparation of status and/or wrap-up reports, approx. 100 hours total)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO 1** *(examination regulations for teaching-degree programmes)*

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**Contents**

The module offers the opportunity to learn correct presenting and mediating scientific questions by giving a tutorial attendant to a lecture at the faculty of chemistry and pharmacy.

**Intended learning outcomes**

The students are able to adequately prepare and present scientific questions, and to guide students in lower semesters.

**Courses** (type, number of weekly contact hours, language — if other than German)

| T (3) |

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Tutoring activities, (preparation of status and/or wrap-up reports, approx. 100 hours total)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<td>The internship is carried out at universities abroad and can be embedded within offered study programs (eg Erasmus). The content requirements should comply with those of the electives of the Chemistry Master program at the University of Würzburg (what has to be ascertained in advance under discussion with the module coordinator).</td>
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<tr>
<td>The students are familiar with working methods at universities abroad. Besides professional competences they have also acquired language and social skills.</td>
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<th>Courses (type, number of weekly contact hours, language — if other than German)</th>
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**Contents**

Work placement in the field of food production or analysis.

**Intended learning outcomes**

Students have become familiar with the occupation of a food chemist.

**Courses** (type, number of weekly contact hours, language — if other than German)

| P (a) |

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written report (approx. 5 pages) or talk (15 minutes)
Language of assessment: German or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
Module title | Food Law, Tobacco Law, Animal Feed Law and Tangented Law
---|---
Abbreviation | o8-LMC-LMRecht-161-m01

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<td>Other prerequisites</td>
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**Contents**

a) General food law, aa) Structure and contents of food law, bb) Structure and contents of EU food law.  
b) Overview of the organisation and purpose of official controls on products and tobacco products pursuant to Section 1 Subsection 1 Sentence 1 No. 2, aa) Administrative structures at the federal and state levels, bb) Constitutional law and general administrative law, cc) Administrative jurisdiction, dd) Offences and legal proceedings, ee) EU institutions and bodies, ff) Legal acts of the EU.  
c) Overview of quality assurance procedures in laboratories and industry, aa) Quality management systems in laboratories and industry (DIN EN ISO 9000 and EN 45000 or ISO/IEC 17000 standards, OECD Principles of Good Laboratory Practice (GLP)), bb) German and EU legislation on conformity assessment including certification and testing, cc) Handbooks and documentation of quality assurance procedures in laboratories and the food industry.

**Intended learning outcomes**

Students are able to identify foods, cosmetics, feeds, consumer goods and tobacco products as well as to assess them on the basis of the relevant laws. They know which national and international bodies are responsible for which food regulatory issues. They have developed the necessary theoretical knowledge to enable them to develop a quality management system and work according to the standards of good laboratory practice.

**Courses**

(type, number of weekly contact hours, language — if other than German)

V (1.3) + V (1.3)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes total)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Pursuant to Section 20 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 6. of Annex 3 of APOLmCh and Section 20 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 2. Letters h, i and j of Annex 1 of APOLmCh.

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Subdivided Module Catalogue for the Subject
Food Chemistry
Master's with 1 major, 120 ECTS credits

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<td>Foreign Studies (short)</td>
<td>08-APM1-161-m01</td>
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<td>Erasmus programme coordinator Chemie (Chemistry)</td>
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Contents

The internship is carried out at universities abroad and can be embedded within offered study programs (e.g. Erasmus). The content requirements should comply with those of the electives of the Chemistry Master program at the University of Würzburg (what has to be ascertained in advance under discussion with the module coordinator).

Intended learning outcomes

The students are familiar with working methods at universities abroad. Besides professional competences they have also acquired language and social skills.

Courses (type, number of weekly contact hours, language — if other than German)

P (0)
Module taught in: German and/or English and potentially language of the respective country

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) report (10 to 20 pages) or b) talk (10 to 20 minutes)
Language of assessment: German and/or English and potentially language of the respective country

Allocation of places

Additional information

Referred to in LPO I (examination regulations for teaching-degree programmes)
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**Contents**

Work placement in the field of food production or analysis.

**Intended learning outcomes**

Students have become familiar with the occupation of a food chemist.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (o)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written report (approx. 5 pages) or talk (15 minutes)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
## Toxicology of Food

**Abbreviation:** 08-LMC-LMTox-161-m01

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**Duration:** 2 semester  
**Module level:** graduate  
**Other prerequisites:** --

### Contents

Harmful effects of natural and synthetic chemicals, toxicodynamics (receptor theory, dose-response relationships); toxicokinetics (absorption, distribution, biotransformation, elimination); classification of toxicants and their biological effects; toxicology and animal testing; methods for toxicity testing (acute, subacute, subchronic, chronic, carcinogenic, mutagenic and teratogenic toxicity tests); principles of epidemiological studies; risk assessment and definition of exposure limits and guidelines.

### Intended learning outcomes

Students are familiar with the toxicokinetics and modes of toxic action of relevant natural and synthetic chemicals as well as with methods for toxicity testing. They have learned the principles of epidemiological studies. They know the steps involved in a risk assessment and in the definition of exposure limits and guidelines. Students are able to independently select an appropriate test for the solution of a given food toxicological question and are able to perform that test.

### Courses

- **Type, number of weekly contact hours, language — if other than German:** V (2) + V (2) + P (2)

### Method of assessment

- **Type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus:**  
  Assessment: a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups of 2 candidates (approx. 30 minutes total) and lab course assessment components: Vortestate and Nachtestate (pre and post-experiment exams, approx. 15 minutes), assessment and documentation of practical assignments (approx. 10 pages) and written report (approx. 5 to 10 pages)  
  Language of assessment: German or English

### Allocation of places

--

### Additional information

Pursuant to Section 18 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 5. of Annex 3 of APOLmCh and Section 18 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 1. Letter d and 2. Letter g of Annex 1 of APOLmCh.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
### Module title
**Master Thesis Food Chemistry**

### Abbreviation
08-LMC-MA-161-m01

### Module coordinator
holder of the Chair of Food Chemistry

### Module offered by
Institute of Pharmacy and Food Chemistry

### ECTS
25

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
--

### Duration
graduate

### Module level
--

### Other prerequisites
--

### Contents
Students search for literature on a problem in food chemistry, select appropriate methods for solution of that problem and use those methods in the laboratory. They prepare a written account of their work.

### Intended learning outcomes
Students independently investigate a problem in food chemistry.

### Courses
No courses assigned to module

### Method of assessment
written thesis (approx. 40 pages)
Language of assessment: German or English

### Allocation of places
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### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)
--
Module title | Development and Validation of Methods in Food Analysis
---|---
Abbreviation | 08-LMC-MEV-161-m01

Module coordinator | holder of the Chair of Food Chemistry
Module offered by | Institute of Pharmacy and Food Chemistry

ECTS | 5
Method of grading | numerical grade
Only after succ. compl. of module(s) | 

Duration | 1 semester
Module level | graduate
Other prerequisites | 

Contents
Development as well as statistical validation of methods for the quantitative analysis of foods, tobacco products, cosmetics, consumer goods and feeds: theory and exercises.

Intended learning outcomes
Students know strategies for the development of a method for the quantitative analysis of products as well as the relevant statistical validation parameters.

Courses (type, number of weekly contact hours, language — if other than German)
V (1) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
term paper (approx. 10 pages)
Language of assessment: German or English

Allocation of places
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Additional information
Pursuant to Section 18 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 1. of Annex 3 of APOLmCh and Section 18 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 1. Letter a and No. II 2. Letters a and c of Annex 1 of APOLmCh.

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**Contents**

Cell fractionation and characterisation, enzyme kinetics, conversion of a substrate with cell fractions and identification of metabolites using instrumental methods of analysis.

**Intended learning outcomes**

Students have developed the ability to independently perform homogenisations and fractionations of cells and tissues as well as to use biochemical methods (e.g. determination of enzyme kinetics) to characterise the fractions. They are able to independently plan an incubation mixture for a metabolic conversion, to perform that conversion and to identify the metabolites using suitable instrumental methods of analysis.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (4) + P (4)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Lab course assessment components: Vortestate and Nachtestate (pre and post-experiment exams, approx. 15 minutes), assessment and documentation of practical assignments (approx. 10 pages) and written report (approx. 5 to 10 pages)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Pursuant to Section 18 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. 1 3. of Annex 3 of APOLmCh and Section 18 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 1. Letter c of Annex 1 of APOLmCh.

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**Contents**

Assessment of the safety of foods on the basis of their constituents.

**Intended learning outcomes**

Students are able to assess the safety of foods in accordance with applicable guidelines for food safety assessment.

**Courses (type, number of weekly contact hours, language — if other than German)**

Ü (0)

**Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)**

written report (approx. 5 pages)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I (examination regulations for teaching-degree programmes)**

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<th>Module title</th>
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<td>Technology of Foodstuffs including water for human use, Cosmetics, Commodities, Tobacco Products, and Animal Feed</td>
<td>08-LMC-LMT-161-m01</td>
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**Contents**

Basic unit operations in the production and processing of foods, tobacco products pursuant to Section 1 Subsection 1 Sentence 1 No. 2, cosmetics, consumer goods and feeds; e.g. mechanical operations (cleaning, sorting, comminution, sieving, mixing, filtering, expressing, emulsification, centrifugation, extracting), thermal operations (heating, cooling and freezing, concentration, drying, distillation), biotechnological processes (e.g. fermentation, acidification).

**Intended learning outcomes**

Students know all relevant processes in food technology as well as examples of their application.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + E (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes total)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Pursuant to Section 20 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 2. of Annex 3 of APOLmCh and Section 20 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 1. Letter e and No. II 2. Letters b and d of Annex 1 of APOLmCh.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<tbody>
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**Contents**

Toxic effects on the ecosystem; risk assessment and definition of exposure limits and guidelines. (Bio)monitoring methods, environmental chemistry and analysis in biotic and abiotic environments.

**Intended learning outcomes**

Students are able to answer retrospective questions in environmental analysis, selecting appropriate (bio)monitoring and analytical methods and performing statistical analyses of data. They are able to assess the ecotoxicity of pollutants and their fate in the environment by performing experiments in the lab.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (1) + V (1) + Ü (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes total)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Pursuant to Section 20 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 5. of Annex 3 of APOLmCh and Section 20 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 2. Letter g of Annex 1 of APOLmCh.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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### Module title
Analysis and Evaluation of Food-stuffs, Cosmetics, Commodities, Tobacco Products, and Animal Feed

### Abbreviation
08-LMC-LMCPM-161-m01

### Module coordinator
holder of the Chair of Food Chemistry

### Module offered by
Institute of Pharmacy and Food Chemistry

### ECTS
6

### Method of grading
Only after succ. compl. of module(s)

### (not) successfully completed
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### Duration
2 semester

### Module level
graduate

### Other prerequisites
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### Contents
Methods for the analysis of foods, tobacco products, cosmetics, consumer goods and feeds including the interpretation of measured data with statistical methods.

### Intended learning outcomes
Students are able to select and apply an appropriate method for the analysis of particular foods, tobacco products, cosmetics, consumer goods or feeds. They are able to interpret the measured data with statistical methods as well as to assess the foods, tobacco products, cosmetics, consumer goods or feeds conclusively. Students are able to independently select relevant analysis parameters for the assessment of foods/feeds containing genetically modified organisms, to independently select appropriate analytical methods, to independently apply those methods as well as to interpret the measured data with appropriate statistical methods. They are able to assess the foods/feeds on the basis of the analytical values.

### Courses
(type, number of weekly contact hours, language — if other than German)
P (8) + P (1) + Ü (1)

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
lab course assessment components: Vortestate and Nachtestate (pre and post-experiment exams, approx. 15 minutes), assessment and documentation of practical assignments (approx. 10 pages) and written report (approx. 5 to 10 pages)
Language of assessment: German or English

### Allocation of places
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### Additional information
Pursuant to Section 18 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 1. of Annex 3 of APOLmCh and Section 18 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 1. Letter a and No. II 2. Letters a and c of Annex 1 of APOLmCh.

### Referred to in LPO I
(examination regulations for teaching-degree programmes)
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<table>
<thead>
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<tbody>
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<td>Courses related to Food Chemistry outside of the Natural Sciences</td>
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<td>1 semester</td>
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<td>Please consult with course advisory service in advance.</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul bietet die Möglichkeit, chemienahe Veranstaltungen anderer Fachbereiche, die nicht explizit in der Studienordnung vorgesehen sind, anrechnen zu lassen. Eine vorherige Rücksprache mit der Fachstudienberatung ist zwingend notwendig.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden erwerben Kompetenzen entsprechend der besuchten Veranstaltungen.

**Courses** (type, number of weekly contact hours, language — if other than German)

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<tr>
<th>Type</th>
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| Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus) |
| Assessment: a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups of 2 candidates (approx. 30 minutes total) or successful completion as certified by lecturer |
| Language of assessment: German or English |

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<table>
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<th>Module title</th>
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<td>Courses related to Food Chemistry within the Natural Sciences</td>
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**Contents**

German contents available but not translated yet.

Das Modul bietet die Möglichkeit, chemienahe Veranstaltungen anderer Fachbereiche, die nicht explizit in der Studienordnung vorgesehen sind, anrechnen zu lassen. Eine vorherige Rücksprache mit der Fachstudienberatung ist zwingend notwendig.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden erwerben Kompetenzen entsprechend der besuchten Veranstaltungen.

**Courses (type, number of weekly contact hours, language — if other than German)**

V (0)

**Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)**

Assessment: a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups of 2 candidates (approx. 30 minutes total) or successful completion as certified by lecturer.

Language of assessment: German or English.

**Allocation of places**

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**Additional information**

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**Referred to in LPO I (examination regulations for teaching-degree programmes)**

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<tr>
<th><strong>Module title</strong></th>
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<td>Advanced Laboratory Courses in the Toxicology of Food</td>
<td>08-LMC-WPV1-161-m01</td>
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<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

Cell culturing techniques, extended toxicity tests (e.g. genotoxicity testing, reporter gene assays).

**Intended learning outcomes**

Students are able to culture adherent and suspension cells independently. They are able to perform toxicity tests under guidance in order to determine the biological potential of constituents of foods, cosmetics, consumer goods or tobacco products.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (8)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Lab course assessment components: Vortestate and Nachtestate (pre and post-experiment exams, approx. 15 minutes), assessment and documentation of practical assignments (approx. 10 pages) and written report (approx. 5 to 10 pages)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Pursuant to Section 18 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 5. of Annex 3 of APOLmCh and Section 18 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 1. Letter d and No. II 2. Letter g of Annex 1 of APOLmCh.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<td>Laboratory Course in Environmental Analysis</td>
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**Contents**

Trace analysis by gas or liquid chromatography-mass spectrometry.

**Intended learning outcomes**

Students are able to perform qualitative and quantitative analyses of environmental contaminants or residues in environmental samples using common mass spectrometric methods.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (8)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Lab course assessment components: Vortestate and Nachtestate (pre and post-experiment exams, approx. 15 minutes), assessment and documentation of practical assignments (approx. 10 pages) and written report (approx. 5 to 10 pages)

Language of assessment: German or English

**Allocation of places**

--

**Additional information**

Pursuant to Section 18 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 5. of Annex 3 of APOLmCh and Section 18 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 1. Letter d and No. II 2. Letter g of Annex 1 of APOLmCh.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<table>
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<th>Module title</th>
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<td>Cosmetics, Commodities and Tobacco Products</td>
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### Contents

Chemical constituents, production and analysis of cosmetics, consumer goods and tobacco products. Chemical changes caused in those products during processing, storage and transportation as well as pharmacological and toxicological effects of their normal and abnormal constituents.

### Intended learning outcomes

Students are familiar with cosmetics, consumer goods and tobacco products as well as with their chemical constituents. They know methods for the analysis of cosmetics, consumer goods and tobacco products, the relevant legal provisions as well as constituents that have pharmacological and toxicological effects.

### Courses

(type, number of weekly contact hours, language — if other than German)

V (1) + V (1)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (60 to 120 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes total)

Language of assessment: German or English

### Allocation of places

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### Additional information

Pursuant to Section 20 Subsection 2 Sentence 1 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. I 1. of Annex 3 of APOLmCh and Section 20 Subsection 3 Sentence 1 APOLmCh. Pursuant to Section 2 Subsection 2 Sentence 2 Verordnung über die Ausbildung und Prüfung der Staatlich geprüften Lebensmittelchemikerinnen und Lebensmittelchemiker (Regulation on the training and examination of state-certified food chemists, APOLmCh) in conjunction with No. II 2. Letter a of Annex 1 of APOLmCh.

Referred to in LPO I (examination regulations for teaching-degree programmes)

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