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: 2021
Responsible: Faculty of Chemistry and Pharmacy
## Contents

The subject is divided into

### Compulsory Courses

- Nutritional Biochemistry
- Nutritional Biochemistry - Practical course
- Toxicology of Food
- Food Law, Tobacco Law, Animal Feed Law and Tangented Law
- Special Food and Animal Feed
- Analysis and Evaluation of Food-stuffs, Cosmetics, Commodities, Tobacco Products, and Animal Feed
- Cosmetics, Commodities and Tobacco Products
- Environmental Analysis
- Technology of Foodstuffs including water for human use, Cosmetics, Commodities, Tobacco Products, and Animal Feed
- Development and Validation of Methods in Food Analysis
- Current Research in Food Chemistry

### Compulsory Electives

- Subfield Laboratory Course in Specific Topic
  - Advanced Laboratory Courses in the Toxicology of Food
  - Laboratory Course in Environmental Analysis
- Subfield Additional Qualification
  - Industrial Internship 1 (Short)
  - Industrial Internship 2 (Long)
  - Safety Evaluation of Food
  - Courses related to Food Chemistry outside of the Natural Sciences
  - Courses related to Food Chemistry within the Natural Sciences
  - Tutoring 1 (practical course)
  - Tutoring 2 (practical course)
  - Foreign Studies (short)
  - Foreign Studies (long)
- Thesis
  - Master Thesis Food Chemistry
  - Master Thesis Defense
The subject is divided into

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<th>ECTS credits</th>
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<td>Thesis</td>
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Content and Objectives of the Programme

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)):

19-May-2021 (2021-55)

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.
Compulsory Courses

(75 ECTS credits)
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

<table>
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<th>ECTS</th>
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<td>7</td>
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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 is creditable for 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. 13. 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 2. Letter e of Annex 1 of APOLmCh.

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

German contents available but not translated yet.

Zellfraktionierung und -charakterisierung, Enzymkinetik, Umsetzung eines Substrates mit Zellfraktionen und Identifizierung der Metaboliten mittels instrumentell-analytischer Verfahren.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden homogenisieren und fraktionieren selbständig Zellen und Gewebe und charakterisieren die Fraktionen mit biochemischen Methoden, insbesondere durch Bestimmung von Enzymkinetiken. Die Studierenden planen selbständig einen Inkubationsansatz für eine metabolische Umsetzung, führen diesen aus und identifizieren die Metaboliten mit geeigneten instrumentell-analytischen Methoden.

### Courses

(P (4) + P (4))

### Method of assessment

Type of assessment: lab course

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

Assessment offered: usually once a year, winter semester

### 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 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.

Referenced in LPO I (examination regulations for teaching-degree programmes)
### Module title

| Toxicology of Food | 08-LMC-LMTox-192-m01 |

### Module coordinator

| holder of the Chair of Food Chemistry |

### Module offered by

| Institute of Pharmacy and Food Chemistry |

### ECTS

| 9 |

### Method of grading

| Only after succ. compl. of module(s) |

### Duration

| 2 semester |

### Module level

| graduate |

### Other prerequisites

|  |

### Contents

German contents available but not translated yet.

Grundlagen der Einwirkungsarten von natürlichen und synthetischen Chemikalien, Toxikodynamik (Rezeptor-Theorie, Dosis-Wirkungs-Beziehungen); Toxikokinetik (Aufnahme, Verteilung, Biotransformation, Elimination); Einteilung von Giftstoffen und ihrer biologischen Wirkung; Toxikologie und Tierversuche; Untersuchungsmethoden der Toxikologie (Prüfung auf akute, subakute, subchronische, chronische, kanzerogene, mutagene und teratogene Wirkungen); Prinzipien von epidemiologischen Erhebungen; Risikoabschätzung und Festlegung von Höchst mengen, Grenzwerten und Richtwerten.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden kennen die Toxikokinetik, die Wirkmechanismen und deren experimentelle Nachweise von lebensmittelchemisch relevanten natürlichen und synthetischen Chemikalien sowie die Prinzipien von epidemiologischen Erhebungen. Sie kennen die Vorgehensweise bei einer Risikoabschätzung und bei der Festlegung von Grenz- und Richtwerten. Die Studierenden wählen selbständig einen angemessenen Test für eine einfache lebensmitteltoxikologische Fragestellung aus und führen ihn durch.

### 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 is creditable for 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 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

Assessment offered: usually once a year, winter semester

### 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 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 | Abbreviation
---|---
Food Law, Tobacco Law, Animal Feed Law and Tangented Law | 08-LMC-LMRecht-161-m01

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

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<th>Method of grading</th>
<th>Other prerequisites</th>
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<th>Module level</th>
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<tbody>
<tr>
<td>2 semester</td>
<td>graduate</td>
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</table>

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 is creditable for 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

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 6. 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 2. Letters h, i and j of Annex 1 of APoLMCh.

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

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

Module title
Special Food and Animal Feed

Abbreviation
08-LMC-SpezLM-212-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)

numerical grade
--

Duration
1 semester

Module level
graduate

Other prerequisites
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Contents
Chemical composition, production and analysis of conventional and special foodstuffs and animal feed. Chemical alteration, function and effect of food ingredients as well as legal regulations in the field of special foodstuffs and animal feed. Conception and performance of experiments as well as evaluation and interpretation of measurement data with the objective to answer a scientific issue.

Intended learning outcomes
The students know the chemistry and analysis of foodstuffs and animal feed as well as of special foodstuffs with functional ingredients or genetically modified organisms. The students are able to understand and critically evaluate scientific studies and assessments of food ingredients and special foodstuffs, also considering legal regulations. The students can identify advantages and disadvantages of different analytical methods and select appropriate methods for answering a scientific issue. The students are able to evaluate the identity, quality and safety of foodstuffs using valid analysis results, appropriate methods for statistical evaluation and presentation.

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

V (1) + V (1) + P (1) + Ü (1)

Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for 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 and c of Annex 1 of APOLmCh.

Referred to in LPO I (examination regulations for teaching-degree programmes)
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## Module Catalogue for the Subject Food Chemistry

### Master's with 1 major, 120 ECTS credits

<table>
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<tr>
<td>Analysis and Evaluation of Food-stuffs, Cosmetics, Commodities, Tobacco Products, and Animal Feed</td>
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<td>Institute of Pharmacy and Food Chemistry</td>
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<th>Module level</th>
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</thead>
<tbody>
<tr>
<td>2 semester</td>
<td>graduate</td>
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</tbody>
</table>

### Contents

Quantitative analysis of relevant ingredients of foodstuffs, tobacco products, cosmetics, commodities and animal feed by applying appropriate calibration and validation strategies. Basic concepts, technological processes, quality and monitoring in the field of animal feed.

### Intended learning outcomes

The students can select an appropriate method for the quantitative analysis of foodstuffs, tobacco products, cosmetics, commodities and animal feed and develop a calibration strategy considering analyte-and matrix-dependent characteristics. They can confirm the validity of test results by selecting suitable validation parameters and evaluate the test results with respect to scientific issues. Due to basic knowledge in the field of products, technology and monitoring of animal feed as well as in the field of animal feeding, the students are able to understand the link between quality of animal feed and quality of foodstuffs and to identify critical parameters in the quality of animal feed.

### Courses

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

- `P (8) + S (1) + S (1)`

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for 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. Letters a, c and d of Annex 1 of APOLmCh.

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

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Module title: Cosmetics, Commodities and Tobacco Products
Abbreviation: 08-LMC-KBT-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: Only after succ. compl. of module(s)
Numerical grade: --

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

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:
V (1) + V (1)

Method of 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 (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 2. Letter a of Annex 1 of APOLmCh.

Referred to in LPO I (examination regulations for teaching-degree programmes):
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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 is creditable for 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 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 2. Letter g of Annex 1 of APOLmCh.

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<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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<table>
<thead>
<tr>
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<th>Module offered by</th>
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<tr>
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<td>Institute of Pharmacy and Food Chemistry</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**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 is creditable for 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**

--

**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 2. 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 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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<table>
<thead>
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<tr>
<td>Development and Validation of Methods in Food Analysis</td>
<td>08-LMC-MEV-212-m01</td>
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<td>Institute of Pharmacy and Food Chemistry</td>
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| ECTS | Method of grading | Only after succ. compl. of module(s) | |
|------|-------------------|--------------------------------------|
| 5    | (not) successfully completed | --                                  |

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

### Contents

German contents available but not translated yet.

Theorie und Übungen zur Entwicklung sowie der statistischen Validierung von Methoden zur quantitativen Analyse von Lebensmitteln, Tabakerzeugnissen, kosmetischen Mitteln, Bedarfsgegenständen und Futtermitteln.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden kennen Entwicklungsstrategien und statistischen Validierungsparameter einer quantitativen analytischen Methode.

### 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 is creditable for bonus)

written exercises (approx 10 pages or talk (20 minutes)

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 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 2. Letters a and c of Annex 1 of APOLmCh.

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title: Current Research in Food Chemistry
Abbreviation: 08-LMC-LMCF-161-m01

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

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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 is creditable for 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: --

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

(15 ECTS credits)
Subfield Laboratory Course in Specific Topic

(5 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Advanced Laboratory Courses in the Toxicology of Food</td>
<td>08-LMC-WPV1-192-m01</td>
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<td>Institute of Pharmacy and Food Chemistry</td>
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<tbody>
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**Contents**

German contents available but not translated yet.
Zellkulturtechniken, erweiterte Toxizitätstests (beispielsweise Genotoxizitätstests oder Reportergenassays).

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

**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 is creditable for 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
Assessment offered: usually once a year, winter semester

**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>
<thead>
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<th>Module title</th>
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<tr>
<td>Laboratory Course in Environmental Analysis</td>
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<table>
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<td>Institute of Pharmacy and Food Chemistry</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
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**Contents**

German contents available but not translated yet.
Spurenanalytik mittels Gas- oder Flüssigkeitschromatographie gekoppelt mit Massenspektrometrie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.
Die Studierenden können qualitativ und quantitativ Umweltkontaminanten oder Rückstände in Umweltproben mittels etablierten massenspektrometrischen Methoden bestimmen.

**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 is creditable for 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
Assessment offered: usually once a year, winter semester

**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)

--
Subfield Additional Qualification

(10 ECTS credits)
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<td>Industrial Internship 1 (Short)</td>
<td>08-LMC-WPZ1-161-m01</td>
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**Module coordinator**  
holder of the Chair of Food Chemistry  
Institute of Pharmacy and Food Chemistry

<table>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
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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)

<table>
<thead>
<tr>
<th>Method of assessment</th>
<th>(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)</th>
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<tr>
<td>written report (approx. 5 pages) or talk (15 minutes)</td>
<td>Language of assessment: German or English</td>
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**Allocation of places**
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**Additional information**
--

**Referred to in LPO I**  
(examination regulations for teaching-degree programmes)
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<table>
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<td>Industrial Internship 2 (Long)</td>
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<tbody>
<tr>
<td></td>
<td>graduate</td>
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</table>

### 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 (0)

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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

### Allocation of places
--

### Additional information
--

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

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<td>Safety Evaluation of Food</td>
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</thead>
<tbody>
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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 is creditable for bonus)

written report (approx. 5 pages)

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)

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<table>
<thead>
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<td>Courses related to Food Chemistry outside of the Natural Sciences</td>
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<th>Other prerequisites</th>
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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**

<table>
<thead>
<tr>
<th>type, number of weekly contact hours, language — if other than German</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 is creditable for 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**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Module title
Courses related to Food Chemistry within the Natural Sciences

Abbreviation
08-LMC-WPZ6-161-m01

Module coordinator
holder of the Chair of Food Chemistry

Module offered by
Institute of Pharmacy and Food Chemistry

ECTS
5

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

(not) successfully completed
--

Duration
1 semester

Module level
undergraduate

Other prerequisites
Please consult with course advisory service in advance.

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 is creditable for 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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<td>Tutoring 1 (practical course)</td>
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<th>Module offered by</th>
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<td>Dean of Studies Chemie (Chemistry)</td>
<td>Faculty of Chemistry and Pharmacy</td>
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<th>Other prerequisites</th>
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<tbody>
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<td>It is not permitted to use activities performed under a research assistant contract for this module. The tutorial must accompany a different course than the tutorial held in module 08-WRM1.</td>
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</table>

**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 is creditable for 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**

--

**Additional information**

--

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

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### Module Catalogue for the Subject

**Food Chemistry**

*Master's with 1 major, 120 ECTS credits*

<table>
<thead>
<tr>
<th>Module title</th>
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<td>Tutoring 2 (practical course)</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean of Studies Chemie (Chemistry)</td>
<td>Faculty of Chemistry and Pharmacy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>(not) successfully completed</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>It is not permitted to use activities performed under a research assistant contract for this module. The tutorial must accompany a different course than the tutorial held in module 08-WRM1.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Courses (type, number of weekly contact hours, language — if other than German)</th>
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<tbody>
<tr>
<td>T (3)</td>
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</table>

<table>
<thead>
<tr>
<th>Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutoring activities, (preparation of status and/or wrap-up reports, approx. 100 hours total)</td>
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<tr>
<td>Language of assessment: German and/or English</td>
</tr>
</tbody>
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### 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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### Foreign Studies (short)

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Foreign Studies (short)</td>
<td>08-APM1-161-m01</td>
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</table>

**Module coordinator**

Erasmus programme coordinator Chemie (Chemistry)

**Module offered by**

Faculty of Chemistry and Pharmacy

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</table>

**Duration**

Graduate

**Other prerequisites**

May not be combined with 08-APM2.

### 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

P (0)

- Module taught in: German and/or English and potentially language of the respective country

### Method of assessment

(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

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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>
<thead>
<tr>
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<td>Foreign Studies (long)</td>
<td>08-APM2-161-m01</td>
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<tr>
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<td>graduate</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 is creditable for bonus)

- a) report (15 to 30 pages) or b) talk (15 to 30 minutes)
  - Language of assessment: German and/or English and potentially language of the respective country

**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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Thesis

(30 ECTS credits)
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):
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**Module title** | **Abbreviation**
---|---
Master Thesis Defense | 08-LMC-KOLL-161-m01

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

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

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<tr>
<td>5</td>
<td>numerical grade</td>
<td>08-LMC-MA</td>
</tr>
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</table>

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

**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 is creditable for 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)
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