M.SC. CHEMISTRY AND PHYSICS OF FUNCTIONAL MATERIALS

M.SC. CHEMIE UND PHYSIK FUNKTIONALER MATERIALIEN

General Information Seminar October 16th, 2019
TODAY’S TOPICS

➤ Welcome
➤ (y)our university, (y)our faculty, (y)our professors
➤ Modules
➤ Route of study
➤ Organizational Issues
➤ Next steps
➤ Further questions?

www.material.uni-koeln.de
(under construction)
OVERVIEW

➤ **Degree**
- Master of Science (M.Sc.)
- enabling for doctoral research
- 300 LP in B.Sc.+M.Sc.

➤ **Duration**
- 3 semester (90 LP)
- optional 4 semester (120 LP)

➤ **Specialty**
- interdisciplinary and research oriented
- individually structured
- general overview on functional materials
- more in the fields of the local research groups in Chemistry and Physics
since 1990 university
earlier „Erziehungswissenschaftliche Hochschule Rheinland-Pfalz (EWH)“
today
more than 16500 students on both campi
(nearly 8500 in Koblenz)
since 2013 second largest university in the state Rheinland-Pfalz
(Rhineland-Palatinate)
FACULTY 3: MATHEMATICS / NATURAL SCIENCES

Institut for Integrated Natural Sciences (IfIN)

Departments of Chemistry and Physics

Campus Koblenz
YOUR PROFESSORS

Wolfgang Imhof
Organic Chemistry
M318

Peter Quirmbach
Technical Chemistry
M116

Silke Rathgeber
Material-physics
G428

Joachim Scholz
Inorganic Chemistry
M219

Christian Fischer
Experimental Physics
G429
Material & Environment

Faculty 3: Mathematics / Natural Sciences

**Bachelor**
- B.Sc. Angewandte Naturwissenschaften (Applied Sciences) since 2011

**Master**
- M.Sc. Applied Physics since 2015 in cooperation with
- M.Sc. BioGeo-Wissenschaften (BioGeoSciences) since 2005

- B.Sc. Mathematische Modellierung (Math. Modeling) since 2015

- B.Sc. BioGeo-Wissenschaften (BioGeoSciences) since 2005

**Double-Subject-Bachelor (B.A./B.Sc.) Education (B.Ed./M.Ed.)**
- Chemistry
- Physics
- Mathematics
- Sports Science
- Biology
- Geography
- Nutrition and Consumer Education

**Bachelor**
- M.Eng. Ceramic Science and Engineering since 2012 in cooperation with
- M.Sc. Applied Physics since 2015

- B.Sc. Ceramic Science and Engineering since 2012 in cooperation with
- M.Sc. Applied Physics since 2015

- M.Sc. BioGeo-Wissenschaften (BioGeoSciences) since 2005

**Bachelor**
- Education BBS in cooperation with since 2008
- Education B.Ed./M.Ed. since 2013
OUR GUIDING PRINCIPLE

**Interdisciplinary problem solving competence in the field of material properties and functional materials**

- Appropriate programs especially in the fields of plastics, coatings, corrosion, surface and interfacial phenomena, high-temperature-materials, catalyzers and rare earth elements.

- Inter-semester and inter-disciplinary network between students and scientists.

- One approach in the educational sector to increase the future viability of the region.
## COMPULSORY MODULES

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Compulsory modules (15 LP)</strong></td>
<td></td>
</tr>
<tr>
<td>03PH2501</td>
<td>Solid State Physics</td>
<td>6</td>
</tr>
<tr>
<td>03XX2401</td>
<td>Synthesis and Characterization of Functional Materials</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td><strong>Research Work (45 LP)</strong></td>
<td></td>
</tr>
<tr>
<td>03XX2402</td>
<td>Research Project (Projektarbeit)</td>
<td>15</td>
</tr>
<tr>
<td>03XX2490</td>
<td>Master Thesis (Masterarbeit)</td>
<td>25</td>
</tr>
<tr>
<td>03XX2499</td>
<td>Oral Final Exam (Mündliche Abschlussprüfung)</td>
<td>5</td>
</tr>
</tbody>
</table>

*color code: always in English, if requested in English, only in German*
# ADVANCED MODULES (18 LP – 30 LP)

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>03CH2401</td>
<td>Modern concepts of inorganic chemistry</td>
<td>6</td>
</tr>
<tr>
<td>03CH2402</td>
<td>Thermochemistry</td>
<td>6</td>
</tr>
<tr>
<td>03CH2403</td>
<td>Polymer chemistry and Ingredient Synthesis</td>
<td>6</td>
</tr>
<tr>
<td>03PH2403</td>
<td>Physics of Metals</td>
<td>6</td>
</tr>
<tr>
<td>03PH2503</td>
<td>Surface Science</td>
<td>6</td>
</tr>
<tr>
<td>03PH2504</td>
<td>Applied Theoretical Physics</td>
<td>6</td>
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<tr>
<td>03PH2505</td>
<td>Polymer Science</td>
<td>6</td>
</tr>
</tbody>
</table>

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# ELECTIVE MODULES 1

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Elective modules (up to 12 LP) as specialization in main topics</td>
<td></td>
</tr>
<tr>
<td>03CH2404</td>
<td>Analytical Chemistry (Analytische Chemie)</td>
<td>7</td>
</tr>
<tr>
<td>03CH2405</td>
<td>Technical Chemistry (Technische Chemie)</td>
<td>7</td>
</tr>
<tr>
<td>03CH2406</td>
<td>Biochemistry (Biochemie)</td>
<td>7</td>
</tr>
<tr>
<td>03CH2407</td>
<td>Current topics in chemistry (Aktuelle Fragen der Chemie)</td>
<td>7</td>
</tr>
<tr>
<td>03PH2402</td>
<td>Current topics in physics (various lectures in English)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>(Aktuelle Fragen der Physik)</td>
<td></td>
</tr>
</tbody>
</table>

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## ELECTIVE MODULES 2

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>03Bl1317</td>
<td>Elective modules (up to 12 LP) as extension of knowledge in neighboring fields</td>
<td></td>
</tr>
<tr>
<td>03GE2308</td>
<td>Environment Microbiology (Umweltmikrobiologie)</td>
<td>6</td>
</tr>
<tr>
<td>03MA1107</td>
<td>Soil Function and Soil Protection (Bodenfunktion und Bodenschutz)</td>
<td>6</td>
</tr>
<tr>
<td>03MA2401</td>
<td>Stochastic (Einführung in die Stochastik)</td>
<td>8</td>
</tr>
<tr>
<td>03MA2401</td>
<td>Modeling and Simulating for Natural Scientists (Modellieren und Simulieren für Naturwissenschaftler)</td>
<td>6</td>
</tr>
</tbody>
</table>

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## ELECTIVE MODULES 3

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Elective modules (up to 12 LP) as extension of knowledge in neighboring fields</td>
<td></td>
</tr>
<tr>
<td>04IM2008</td>
<td>New Product Development (SS)</td>
<td>6</td>
</tr>
<tr>
<td>04IM2009</td>
<td>Entrepreneurial Design Thinking (WS)</td>
<td>6</td>
</tr>
<tr>
<td>04IN2007</td>
<td>Real-Time Systems (Echtzeitsysteme) (WS)</td>
<td>6</td>
</tr>
<tr>
<td>04IN2026</td>
<td>Introduction to Web Science (WS)</td>
<td>8</td>
</tr>
<tr>
<td>04IN2035</td>
<td>Wireless Communication (Drahtlose Kommunikation) (WS)</td>
<td>6</td>
</tr>
<tr>
<td>04WI2024</td>
<td>Information Design (WS)</td>
<td>6</td>
</tr>
</tbody>
</table>

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# ELECTIVE MODULES IN ENGLISH (0 – 12 LP)

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Elective modules (up to 12 LP) as extension of knowledge in neighboring fields</td>
<td></td>
</tr>
<tr>
<td>04IM2008</td>
<td>Risk Management in verteilten Systeme (SS) (IT Risk Management)</td>
<td>6</td>
</tr>
<tr>
<td>04PH2402</td>
<td>Current topics in physics (various lectures)</td>
<td>6</td>
</tr>
</tbody>
</table>

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SUMMARY

➢ compulsory modules 60 LP
  specialization modules 18 LP
  elective modules in
  physics (0-12 LP), chemistry (0-12 LP),
  economics (0-18 LP), computer science (0-18 LP) 12 LP
  = 90 LP

➢ Therefore the master program is offered in English only!

➢ Further elective modules are only offered in German: chemistry (28 LP), mathematics (14 LP), computer science (12 LP), physics (6 LP), biology (6 LP), geo sciences (6 LP), economics (6 LP)
## ROUTE OF STUDY (STARTING WINTER)

<table>
<thead>
<tr>
<th>Sem</th>
<th>Synthesis and Characterization of Functional Materials</th>
<th>3-5 advanced modules</th>
<th>0-2 elective modules</th>
<th>research project</th>
<th>LP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Synthesis and Characterization of Functional Materials</td>
<td>3-5 advanced modules</td>
<td>0-2 elective modules</td>
<td>research project</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Solid State Physics</td>
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<tr>
<td></td>
<td>9 LP</td>
<td>6 LP</td>
<td>Σ 18-30 LP</td>
<td>Σ 0-12 LP</td>
<td>Σ 15 LP</td>
</tr>
<tr>
<td>2</td>
<td>Synthesis and Characterization of Functional Materials</td>
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<td></td>
<td>Solid State Physics</td>
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<td>9 LP</td>
<td>6 LP</td>
<td>Σ 18-30 LP</td>
<td>Σ 0-12 LP</td>
<td>Σ 15 LP</td>
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<tr>
<td>3</td>
<td>Master thesis</td>
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<td>25 LP</td>
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</tbody>
</table>
# Route of Study (Starting Summer)

<table>
<thead>
<tr>
<th>Sem</th>
<th>Title</th>
<th>Modules</th>
<th>Elective Modules</th>
<th>Research Project</th>
<th>Total LP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Synthesis and Characterization of Functional Materials</td>
<td>Solid State Physics</td>
<td>3–5 advanced modules</td>
<td>0–2 elective modules</td>
<td>30 LP</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>research project</td>
<td>9 LP</td>
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<td></td>
<td>Σ 18–30 LP</td>
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<td>Σ 0–12 LP</td>
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<td></td>
<td>Σ 15 LP</td>
</tr>
<tr>
<td>2</td>
<td>Synthesis and Characterization of Functional Materials</td>
<td>Solid State Physics</td>
<td>3–5 advanced modules</td>
<td>0–2 elective modules</td>
<td>30 LP</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>research project</td>
<td>9 LP</td>
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<td></td>
<td>Σ 18–30 LP</td>
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<td>Σ 0–12 LP</td>
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<td>Σ 15 LP</td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>Master thesis</td>
<td>30 LP</td>
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<td>Oral final exam</td>
<td>25 LP</td>
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<td>5 LP</td>
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<td>90 LP</td>
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M.Sc.
MODULE 03XX2401 IN WINTER 2019/2020

Mon, October 28th 2019 2.00 pm Written Exam (Sub module exam 33240151) (enrollment possible till October 14th, 2019)

Tue, October 22nd, 2019 4.00 pm Students’ presentation
5.00 pm Students’ presentation

Mon, November 4th, 2019 2.00 pm Imhof
Tue, November 6th, 2019 4.00 pm Students’ presentation
5.00 pm Students’ presentation

Mon, November 11th, 2019 2.00 pm Imhof
Tue, November 13th, 2019 4.00 pm Students’ presentation
5.00 pm Students’ presentation

Mon, November 18th, 2019 2.00 pm Fischer
Tue, November 20th, 2019 4.00 pm Students’ presentation
5.00 pm Students’ presentation

Enrollment and Cancellation for courses ends on November, 24th 2019

If changes appear, they will be organized by the professors
MODULE 03XX2401 IN WINTER 2018/2019

Mon, November 25th, 2019  2.00 pm  Fischer
Tue, November 26th, 2019  4.00 pm  Students’ presentation
                           5.00 pm  Students’ presentation
Mon, December 2nd, 2019  2.00 pm  Rathgeber
Tue, December 3rd, 2019  4.00 pm  Students’ presentation
                           5.00 pm  Students’ presentation
Mon, December 9th, 2019  2.00 pm  Rathgeber
Tue, December 20th, 2019 4.00 pm  Students’ presentation
                           5.00 pm  Students’ presentation
Mon, December 16th, 2019 2.00 pm  Scholz
Tue, December 17th, 2019  4.00 pm  Students’ presentation
                           5.00 pm  Students’ presentation

If changes appear, they will be organized by the professors
MODULE 03XX2401 IN WINTER 2018/2019

Mon, January 6th, 2020  2.00 pm  Scholz
Tue, January 8th, 2020  4.00 pm  Students’ presentation
                         5.00 pm  Students’ presentation
Mon, January 13th, 2020  2.00 pm  Quirmbach
Tue, January 14th, 2020  4.00 pm  Students’ presentation
                         5.00 pm  Students’ presentation
Mon, January 20th, 2020  2.00 pm  Quirmbach
Tue, January 21st, 2020  4.00 pm  Students’ presentation
                         5.00 pm  Students’ presentation
                         (last)
Mon, February 10th, 2020  2.00 pm  Sub-module exam

If changes appear, they will be organized by the professors
MODULE 03XX2401 IN WINTER 2018/2019

Documentation of the seminar participation

<table>
<thead>
<tr>
<th>Name of student:</th>
<th>Registration-No.:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Title of Talk attended</th>
<th>Date</th>
<th>Signature of supervising Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<tr>
<td>2</td>
<td></td>
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<td>3</td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
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<tr>
<td>6</td>
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</tbody>
</table>

**Own Presentation**

**Topic:**

**Date:**

**Grade:**
Monday, February 10th, 2020  2.00 pm Written Exam (Sub-module exam 35240151)

Obligatory registration via Klips for the exams:

The exams (February 10th and April 20th, 2020) count as first trial no matter if you participate or not!

Registration necessary till January 28th, 2020 for one of the exams.
Please register for all courses and lectures and each exam. It is obligatory!

also available in English

all courses start in KW 43 (October, 21\textsuperscript{st})
OLAT (WWW.VCRP.DE)
You can choose a convenient language for you in “System Settings”
EVALUATION

in January 2020

your version will be in English

Legende

Fragetext

Allgemeines

Welchen Studienabschluss streben Sie an?

BEd Gymnasium

BEd Realschule+

85.7%

14.3%

27
ORGANIZATIONAL ISSUES ON EXAMS

Written exam

➢ all courses of the module have to be documented (in KLIPS) before taking a sub-module exam, but as soon as all courses are done (de-register if necessary in time) the exam has to be taken

➢ first trial has to be done end of this semester or beginning of next semester (decision has to be done before end of registration to exam in this semester – else failed once)

➢ register resp. unsubscribe in KLIPS till 14 days before exams (starting now)

➢ up to three attempts, but none for improvement

➢ use only of technical aids permitted by the lecturer (e.g. formulary, calculator)

➢ no electronic devices within reach (if so, failed)

➢ The seminar presentation counts as one exam as well. So you have to agree with one professor on a presentation date and topic and register for this exam in Klips as well!
ORGANIZATIONAL ISSUES ON EXAMS

Oral exam

➢ all courses of the module have to be documented (in KLIPS) before taking a module exam, but as soon as all courses are done (de-register if necessary in time) the exam has to be taken

➢ first trial has to be done end of this semester or begin of next semester (decision has to be done before end of registration to exam in this semester – else failed once)

➢ register in KLIPS (exams are sorted by date of exam not course)

➢ register resp. unsubscribe till 14 days before exams (starting now)

➢ up to three attempts, but none for improvement

➢ date is arranged with lecturer prior enrollment in KLIPS
NEXT THINGS TO DO

➤ Enroll for courses within this week

➤ Get safety instructions (in German as a seminar, in English on paper)
  - physics  Monday, October 21st, 2019  2.00 pm G410
  - chemistry  Thursday, October 17th, 2019  8.00 am  M201

➤ Participate in student council (Fachschaft)
  AnNa + CPfM = ca. 50

➤ Further Questions?
MUTUAL BOARD OF EXAMINERS

Bachelor *Angewandte Naturwissenschaften*  
(Applied Natural Sciences) and  
Master *Chemistry and Physics of Functional Materials*  
(Chemie und Physik funktionaler Materialien)

- Prof. Dr. Silke Rathgeber (chairwoman)  
- Prof. Dr. Wolfgang Imhof  
- Prof. Dr. Werner Manz  
- Prof. Dr. Joachim Scholz  
- Dr. Almuth Sax  
- Petra Kires  
- Andrey Dashkevich (student)