M.SC. CHEMISTRY AND PHYSICS OF FUNCTIONAL MATERIALS

M.SC. CHEMIE UND PHYSIK FUNKTIONALER MATERIALIEN

General Information Seminar 17 October 2018
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
UNIVERSITY KOBLENZ-LANDAU

Fachbereich 1: Bildungswissenschaften
Fachbereich 2: Philologie / Kulturwissenschaften
Fachbereich 3: Mathematik / Naturwissenschaften
Fachbereich 4: Informatik
Fachbereich 5: Erziehungswissenschaften
Fachbereich 6: Kultur- und Sozialwissenschaften
Fachbereich 7: Natur- und Umweltwissenschaften
Fachbereich 8: Psychologie

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

Stefan Wehner  
Experimental Physics  
G429
GUIDING THEME IN RESEARCH

Material & Environment

Faculty 3: Mathematics / Natural Sciences

Material Properties and Functional Surfaces

Modeling and Simulation

Biodiversity and Ecosystems

Education
Material & Environment

Faculty 3: Mathematics / Natural Sciences

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

Master
- B.Sc. Angewandte Naturwissenschaften (Applied Sciences) since 2011
- M.Sc. Applied Physics since 2015 in cooperation with
- M.Eng. Ceramic Science and Engineering since 2012 in cooperation with
- M.Sc. BioGeo-Wissenschaften (BioGeoSciences) since 2008
- M.Sc. Mathematical Modelling of Complex Systems since 2015
- M.Sc. Mathematical Modelling of Complex Systems since 2015
- M.Sc. Mathematical Modelling of Complex Systems since 2015

Education
- BBS in cooperation with
- since 2008
- since 2013

M.Sc. BioGeo-Wissenschaften (BioGeoSciences) since 2008

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

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

B.Sc. Mathematische Modellierung (Math. Modeling) since 2015
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>
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<tr>
<td>03XX2402</td>
<td>Research Project (Projektarbeit)</td>
<td>15</td>
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<tr>
<td>03XX2490</td>
<td>Master Thesis (Masterarbeit)</td>
<td>25</td>
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<tr>
<td>03XX2499</td>
<td>Oral Final Exam (Mündliche Abschlussprüfung)</td>
<td>5</td>
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*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>
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<tr>
<td>03CH2403</td>
<td>Polymer chemistry and active substance synthesis</td>
<td>6</td>
</tr>
<tr>
<td>03PH2403</td>
<td>Physics of Metals</td>
<td>6</td>
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<tr>
<td>03PH2503</td>
<td>Surface Science</td>
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<tr>
<td>03PH2504</td>
<td>Applied Theoretical Physics</td>
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<tr>
<td>03PH2505</td>
<td>Polymer Science</td>
<td>6</td>
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## ELECTIVE MODULES 1

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
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<tbody>
<tr>
<td>03CH2404</td>
<td>Analytical Chemistry (Analytische Chemie)</td>
<td>7</td>
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<tr>
<td>03CH2405</td>
<td>Technical Chemistry (Technische Chemie)</td>
<td>7</td>
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<tr>
<td>03CH2406</td>
<td>Biochemistry (Biochemie)</td>
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<tr>
<td>03CH2407</td>
<td>Current topics in chemistry</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>(Aktuelle Fragen der Chemie)</td>
<td></td>
</tr>
<tr>
<td>03PH2402</td>
<td>Current topics in physics</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>(Aktuelle Fragen der Physik)</td>
<td></td>
</tr>
</tbody>
</table>

Elective modules (up to 12 LP) as specialization in main topics

*color code: always in English, if requested in English, only in German*
# ELECTIVE MODULES 2

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective modules (up to 12 LP) as extension of knowledge in neighboring fields</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03BI1317</td>
<td>Environment Microbiology (Umweltmikrobiologie)</td>
<td>6</td>
</tr>
<tr>
<td>03GE2308</td>
<td>Soil Function and Soil Protection (Bodenfunktion und Bodenschutz)</td>
<td>6</td>
</tr>
<tr>
<td>03MA1107</td>
<td>Stochastic Models (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>

**color code:** *always in English, if requested in English, only in German*
## ELECTIVE MODULES 3

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>04IM2008</td>
<td>New Product Development</td>
<td>6</td>
</tr>
<tr>
<td>04IM2009</td>
<td>Scientific Entrepreneurship and Technology Transfer (Entrepreneurship und Technologietransfer)</td>
<td>6</td>
</tr>
<tr>
<td>04IN2007</td>
<td>Real-Time Systems</td>
<td>6</td>
</tr>
<tr>
<td>04IN2026</td>
<td>Introduction to Web Science</td>
<td>8</td>
</tr>
<tr>
<td>04IN2032</td>
<td>Basics of Embedded Systems</td>
<td>6</td>
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<tr>
<td>04IN2035</td>
<td>Wireless Communication (Drahtlose Kommunikation)</td>
<td>6</td>
</tr>
<tr>
<td>04WI2001</td>
<td>Advanced Enterprise Information Management</td>
<td>6</td>
</tr>
<tr>
<td>04WI2013</td>
<td>Enterprise Architecture Modeling</td>
<td>6</td>
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<tr>
<td>04WI2024</td>
<td>IT-Risk-Management</td>
<td>6</td>
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</tbody>
</table>

Elective modules (up to 12 LP) as extension of knowledge in neighboring fields

color code: *always in English, if requested in English, only in German*
## ELECTIVE MODULES IN ENGLISH (0 – 12 LP)

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
<th>credit points [LP]</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>04IM2008</td>
<td>New Product Development</td>
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<tr>
<td>04IN2007</td>
<td>Real-Time Systems</td>
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<td>04IN2026</td>
<td>Introduction to Web Science</td>
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<tr>
<td>04IN2032</td>
<td>Basics of Embedded Systems</td>
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</tr>
<tr>
<td>04WI2001</td>
<td>Advanced Enterprise Information Management</td>
<td>6</td>
</tr>
<tr>
<td>04WI2013</td>
<td>Enterprise Architecture Modeling</td>
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</tr>
</tbody>
</table>

more elective module in German only

**color code:** always in English, if requested in English, only in German
SUMMARY

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

= 90 LP

Therefore the master program is offered as 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>Course</th>
<th>Modules</th>
<th>Elective Modules</th>
<th>Research Project</th>
<th>LP</th>
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<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>2</td>
<td>Synthesis and Characterization of Functional Materials</td>
<td>Solid State Physics</td>
<td>3-5 advanced modules</td>
<td>research project</td>
<td>30</td>
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<td>9 LP</td>
<td>6 LP</td>
<td>Σ 18-30 LP</td>
<td>Σ 15 LP</td>
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<tr>
<td>3</td>
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<td>Master thesis</td>
<td>30</td>
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<td>Oral final exam</td>
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<td>25 LP</td>
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<td>Sem</td>
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<td>Elective Modules</td>
<td>Research Project</td>
<td>LP</td>
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<td>research project</td>
<td>6 LP</td>
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<td>9 LP</td>
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<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>
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<td>Master thesis</td>
<td>30</td>
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<td></td>
<td>Oral final exam</td>
<td>25 LP</td>
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<td>5 LP</td>
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<td>M.Sc. 90</td>
</tr>
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</table>
MODULE 03XX2401 IN WINTER 2018/2019

Mo, 22 October 2018  14-16 Introduction by all the professors
                   Open questions about the Master program
Tu, 23 October 2018  16-18 Wehner (from 05.11.2018)
Mo, 29 October 2018  14-16 Wehner
Tu, 30 October 2018  16-18 Written Exam (Module 03XX2401)
                   (enrollment possible till 15 October)
Mo, 05 November 2018 - - -
Tu, 06 November 2018  16:00 Students' presentation
                   17:00 Students' presentation
Mo, 12 November 2018 14-16 Imhof
Tu, 13 November 2018  16:00 Students' presentation
                   17:00 Students' presentation
Mo, 19 November 2018 14-16 Imhof
Tu, 20 November 2018  16:00 Students' presentation
                   17:00 Students' presentation

Enrollment and Cancellation for courses ends on 25 November 2018

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

Mo, 26 November 2018 14-16 Rathgeber
Tu, 27 November 2018 16:00 Students' presentation
17:00 Students' presentation

Mo, 03 December 2018 14-16 Rathgeber
Tu, 04 December 2018 16:00 Students' presentation
17:00 Students' presentation

Mo, 10 December 2018 14-16 Scholz
Tu, 11 December 2018 16:00 Students' presentation
17:00 Students' presentation

Mo, 17 December 2018 14-16 Scholz
Tu, 18 December 2018 16:00 Students' presentation
17:00 Students' presentation

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

Mo, 07 January 2019  14-16 Quirmbach
Tu, 08 January 2019  16:00 Students' presentation
17:00 Students' presentation

Mo, 14 January 2019  14-16 Quirmbach
Tu, 15 January 2019  16:00 Students' presentation
17:00 Students' presentation (last)

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

**Quirmbach**

Students' presentation

Students' presentation (last)

If changes appear, they will be organized by the professors

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<table>
<thead>
<tr>
<th>Name of student:</th>
<th>Registration-No.:</th>
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</thead>
<tbody>
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<tbody>
<tr>
<td>% attended</td>
<td>Date</td>
<td>Signature of supervising lecturer</td>
<td></td>
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<td>6</td>
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</tbody>
</table>

Own Presentation:

Topic:

Date:

Grade:

Form available on OLAT
MODULE 03XX2401 IN WINTER 2018/2019

Short Course (additional certificate)
“Optics of Photonic Crystals”
by Vasyl Moiseyenko (DNU - Dnepropetrovsk National University, Ukraine)
Mo, 21 January 2019  14-16  Lecture 1
Mo, 21 January 2019  16-18  Lecture 2
Tu, 22 January 2019    16-18  Lecture 3
Tu, 22 January 2019    18-20  Lecture 4

Short Course (additional certificate)
“EPR in the Crystals with Structural Phase Transitions”
by Mikhail Trubitsyn (DNU - Dnepropetrovsk National University, Ukraine)
Mo, 28 January 2019  14-16  Lecture 1
Mo, 28 January 2019  16-18  Lecture 2
Tu, 29 January 2019    16-18  Lecture 3
Tu, 29 January 2019    18-20  Lecture 4
MODULE 03XX2401 IN WINTER 2018/2019

Mo, 04 February 2019  14-16 Written Exam (Module 03XX2401)
last time for first trial / 90 min
for students started till summer 2018
(enrollment possible till 21 January 2019
resp. make decision for exam in April 2019)

Mo, 04 February 2019  14-15 Written Exam (Lecture 3524015)
first time / 45 min
for students starting from winter 2018/2019
(enrollment possible till 21 January 2019
resp. make decision for exam in April 2019)
Please register for all courses and lecture and each exam. It is obligatory!

also available in English

all courses start in KW 43 (22.04.)
OLAT (WWW.VCRP.DE)
OLAT (WWW.VCRP.DE)

You can choose an convenient language for you in “System Settings”
EVALUATION

in June 2018

your version will be in English

Legende

Welchen Studienabschluss streben Sie an?

BEd Gymnasium 85.7%  
BEd Realschule+ 14.3%
**ORGANIZATIONAL ISSUES ON EXAMS**

**Written 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 trail 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 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)

➤ from WS 2018/2019 module exams only for one-semester modules (two-semester modules offer part exam each semester)
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, 09.04.2018  14-16    G410
  - chemistry     Wednesday, 11.04.2018 12-14    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. Wolfgang Imhof
► Prof. Dr. Silke Rathgeber
► Prof. Dr. Joachim Scholz
► Prof. Dr. Stefan Wehner (chairman)
► Dr. Almuth Sax
► Petra Kires
► Andrey Dashkevich (student)