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Attachment 2
Modules of the Degree Course Master: Chemistry

Note:
A list of the literature currently required for the modules of the degree course MSc chemistry is attached separately. This list will be updated constantly and made available to the students at the beginning of each semester.

module description	**Solid-State and Materials Chemistry**
module code	**Chemie-MG01**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 1st semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should … • possess advanced knowledge of the concepts necessary to describe the chemical and physical properties of modern materials • possess knowledge of the relationships between structure and properties of solids • have an overview of the methods necessary for characterisation • have gathered experience in sophisticated preparation techniques for the depiction of modern materials • be proficient in maintaining safety at work
content of module	• Synthesis, structure and properties of selected clusters • Introduction to sol-gel chemistry (“soft chemistry”; chimie douce) • Particular aspects of solid-state chemistry and materials science • Laboratory course on preparative inorganic materials chemistry
forms of instruction	• lecture (1 h/week) • seminar (0.7 h/week) • laboratory course (2.7 h/week)
total workload in hours	lecture attendance hours — 1 h/week *15 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h laboratory course attendance hours — 10 days á 4 h — 40 h preparation, follow-up — 1 h/laboratory course day — 10 h protocols — 2 h/ laboratory course day — 20 h seminar attendance hours — 10 days á 1 h — 10 h preparation, follow-up — 1 h/attendance hours — 10 h presentation and elaboration — 38 h written examination preparation for written examination — 20 h written examination — 2 h Σ 180 h
examinations	• Written examination or oral examination (60%) (admission requirement to written examination: completion of all protocols and presentations) • Presentation (oral and written) (40%)
credit points	6 credit points

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module begin and duration	winter semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	40 / internet
date	* please see separate list for the current semester
literature	* please see separate list for the current semester

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module description	**Separation Process and Structural Analysis**
module code	**Chemie-MG02**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry 1st semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	professors of organic chemistry
prerequisites	none
course aims	Students should be able to… • analyse the structure of complex organic-chemical compounds • separate and analyse complex mixtures • document research results
content of module	• Separation techniques of organic chemistry and interpretation of analyses • separate and analyse complex mixtures • document research results
forms of instruction	• lecture (1.6 h/week) • laboratory course (1.7 h/week) • practical course (1 h/week)
total workload in hours	lecture attendance hours: 24 h preparation, follow-up 24 h laboratory course attendance hours: 25 h preparation, follow-up, protocols 40 h practical course attendance hours: 14 h preparation, follow-up 28 h preparation for written examination 23 h written examination 2 h 180 h
examinations	• Written examination or oral examination (100%) (prerequisite for admission to written examination: successful completion of the laboratory course)
credit points	10 credit points
module begin and duration	winter semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	40 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Physical Solid-State Chemistry I**
module code	**Chemie-MG03**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 1st semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should … • know the most important concepts of physical solid-state chemistry of volume • have a command of the most important chemical methods of controlling the properties of materials • be able to judge the chemical stability of the most common materials under various conditions independently work on the selected materials for a given problem
content of module	• Phase diagrams and phase stability • Stoichiometry control • Doping methods • Main fields of application for the most important classes of materials
forms of instruction	• lecture (1 h/week) • seminar (2 h/week) • project work (0.3 h/week)
total workload in hours	<u>lecture</u> attendance hours — 5 weeks á 3 h — 15 h preparation, follow-up — 1 h/attendance hours — 15 h <u>seminar</u> attendance hours — 14 days á 2 h — 28 h preparation, follow-up — 0,5 h/attendance hours — 14 h <u>project work “properties of materials”</u> group work — 6 weeks á 7h — 42 h talk with the lecturers — 5 weeks, 1h each — 5 h compiling the (written) presentation — 30 h preparing the oral presentation — 11 h <u>written examination</u> preparation for written examination — 18 h written examination (following the lecture) — 2 h Σ 180 h
examinations	• written examination (60%, 50 % of the written exam questions must be answered correctly to pass the course) • Presentation (oral and written) (40 %)
credit points	6 credit points
module begin and duration	winter semester; 1 semester
language	* please see separate list for the current semester

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intake capacity of course/ form of registration	40 /internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Elemental and Environmental Analysis**
module code	**Chemie-MG04**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry 1st semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • comprehend the interdisciplinary interaction of chemistry, biology, earth science and environmental science and perceive mutual overlaps • be able to transform scientific observations and readings into mathematically exploitable data • be able to present scientific results in a well-structured form • be able to perceive the tasks and strategies of modern elemental and environmental analysis • comprehend the significance of elemental and isotope analysis for inorganic, organic and bioorganic chemistry • become acquainted with highly sensitive instrumental methods and techniques in theory and practice • perceive the significance of quality assurance and standardisation • apply methods for the statistical assessment of data
content of module	• Perspectives of analytical chemistry • Isotope analysis • Determination of age and origin • Ultratrace analysis • Particle analysis • Surface analysis • Analytical microprobes • Ionisation processes of mass spectrometry • Univariate and multivariate calibration • Chemometrics and information theory
forms of instruction	• lecture (1 h/week) • seminar (1 h/week) • practical courses (3.2 h/week)
total workload in hours	<u>lecture</u> attendance hours — 1 h/week * 15 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h <u>practical courses</u> attendance hours — 12 days á 4h — 48 h preparation, follow-up — 2 h/laboratory course day — 24 h preparing protocols — 2 h/laboratory course day — 24 h <u>seminar</u> attendance hours — 1 h/week * 15 weeks — 15 h preparation, follow-up — 2 h/attendance hours — 30 h seminar work and final report — 9 h Σ 180 h
examinations	• (Oral) presentation (50 %) • Report (50 %)
credit points	6 credit points
module begin and duration	winter semester; 1 semester

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language	* please see separate list for the current semester
intake capacity of course/ form of registration	30 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Bioorganics**
module code	**Chemie-MG05**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	None
course aims	Students should: • know the most important concepts of bioorganic chemistry • have a comprehensive overview of the different groups of metalloproteins • have consolidated knowledge of modelling metalloproteins with complexes of low molecular weight • be proficient in maintaining safety at work
content of module	• Chemical structure of metalloproteins • Functional models of metalloenzymes • Reciprocation of DNA and metal complexes • Practical applications
forms of instruction	• lecture (1 h/week) • seminar (0.7 h/week) • laboratory course (2,7 h/week)
total workload in hours	<u>lecture</u> attendance hours — 1 h/week *15 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h <u>laboratory course</u> attendance hours — 10 days á 4 h — 40 h preparation, follow-up — 1 h/laboratory course day — 10 h protocols — 2 h/ laboratory course day — 20 h <u>seminar</u> attendance hours — 10 days á 1 h — 10 h preparation, follow-up — 1 h/attendance hours — 10 h presentation and elaboration — 38 h <u>written examination</u> preparation for written examination — 20 h written examination — 2 h Σ 180 h
examinations	• Written examination or oral examination (60%) (admission requirement to the written examination: completion of all protocols and presentations) • Presentation (oral and written) (40%)
credit points	6 credit points
module begin and duration	summer semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	40 /internet

date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

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module description	**Organic Chemistry, Advanced Synthesis**
module code	**Chemie-MG06**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses	MSc chemistry 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	professors of organic chemistry
prerequisites	none
course aims	Students should: • learn complex multistage syntheses (theory and practice) and methods • have the ability to work through current literature and present findings • be able to document and present research results • be proficient in maintaining safety at work
content of module	• Modern multistage syntheses • Special working methods of organic chemistry • Catalytical methods • Stereoselective methods and retrosynthesis • Seminar on academic papers
forms of instruction	• laboratory course (4.2 h/week) • seminar (1.3 h/week)
examinations	• Written examination or oral examination (100 %) (prerequisite: successful completion of the laboratory courses, successful presentation exercises)
credit points	6 credit points
workload	laboratory course attendance hours: 63 h preparation, follow-up, protocols 34 h seminar attendance hours: 20 h preparation, follow-up 40 h preparation for written examination 20 h written examination 3 h Σ 180 h
module begin and duration	summer semester, 1 semester
language	* please see separate list for the current semester
date	* please see separate list for the current semester
intake capacity / form of registration	40 / internet
required literature	* please see separate list for the current semester

module description	**Organic-Chemical Reaction Mechanisms and Structural Analysis**
module code	**Chemie-MG06**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	BSc chemistry 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • gain the ability of working out and interpreting complex organic chemical reaction mechanisms using physical-organic methods • be able to perform a structural analysis of complex organic chemical compounds • be able to document and present research results • possess the ability to review current literature and present findings • be proficient in maintaining safety at work
content of module	• Physical-organic chemistry (kinetics, mechanisms, intermediates, stereochemistry) • Separation techniques of organic chemistry and interpretation of analyses • Spectroscopy of complex organic molecules: NMR-, IR-, UV/Vis spectroscopy, mass spectrometry; independent reading and interpretation
forms of instruction	• lecture (1.6 h/week) • laboratory course (1.3 h/week) • seminar (0.7 h/week)
total workload in hours	<u>lecture</u> attendance hours — 12 weeks á 2 h — 24 h preparation, follow-up — 0.5 h/attendance hours — 12 h <u>laboratory course</u> attendance hours — 5 days á 4 h (block course, 1 week) — 20 h preparation, follow-up — 1.5 h/attendance hours — 30 h protocols — 2 h/attendance hours — 40 h <u>seminar</u> attendance hours — 1 week á 2 h/day — 10 h preparation, follow-up — 2 h/attendance hours — 20 h <u>written examination</u> preparation for written examination — 22 h written examination — 2 h Σ 180 h
examinations	• Written examination (60%) (requirement for admission to written examination: completion of all protocols) • (Oral) presentation during the seminar (40%)
credit points	6 credit points
module begin and duration	summer semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/	40 / internet

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form of registration	
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Physical Solid-State Chemistry II**
module code	**Chemie-MG07**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	BSc chemistry, BSc materials science 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • know the most important concepts of the physical chemistry of surfaces • have a command of the most important methods of controlling surface properties • be able to judge the stability of the most common surfaces under various conditions • independently work on the surface problem of a given topic
content of module	• Surface structure • Reactive surfaces • Manufacturing process • Main fields of application of surface science
forms of instruction	• lecture (1 h/week) • seminar (2 h/week) • project work (0.3 h/week)
total workload in hours	lecture attendance hours — 5 weeks á 3 h — 15 h preparation, follow-up — 1 h/attendance hours — 15 h seminar attendance hours — 14 days á 2 h — 28 h preparation, follow-up — 0.5 h/attendance hours — 14 h project work “properties of materials” subsequent group work — 6 weeks á 7 h — 42 h discussion with lecturers — 5 weeks á 1 h — 5 h writing the report — 30 h preparing oral presentation — 11 h written examination preparation for written examination — 18 h written examination (following the lecture) — 2 h Σ 180 h
examinations	• written examination (60%, 50 % of the written exam questions must be anwered correctly to pass) • Report and (oral) presentation (40 %)
credit points	6 credit points
module begin and duration	summer semester; 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	40 / internet

date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Bioanalysis**
module code	**Chemie-MG08**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should be able to: • comprehend and work on issues and test results within an interdisciplinary context • perceive and assess chemical aspects of biological and bio-medical research • translate readings into exploitable test results • structure test results and from these create generally useable presentations • perceive the tasks and strategies of modern bioanalysis • assess current methods of separation, enrichment, detection, identification, characterisation and quantitative analysis • understand and apply techniques based on spectroscopy, spectrometry, surface science, radio analysis, enzymatics and immunochemistry • describe current foci of international research
content of module	• Bioanalytical methods of chromatography (micro, capillary and nano HPLC) • Electrophoretical methods • Methods of surface science in bioanalysis • Computerised methods and evaluation processes • Imaging processes • Protein analysis, proteomics • Chemical and mass spectromectical peptide sequencing • Analysis of oligonucleotides, carbohydrates and lipids • Function analysis
forms of instruction	• lecture (1 h/week) • practical course (3.2 h/week) • seminar (1 h/week)
total workload in hours	<u>lecture</u> attendance hours — 1 h/week * 15 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h <u>practical courses</u> attendance hours — 12 days á 4 h — 48 h preparation, follow-up — 2 h/laboratory course day — 24 h writing the protocol — 2 h/laboratory course day — 24 h <u>seminar</u> attendance hours — 1 h/week * 15 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h preparation of report — 10 h preparation of oral presentation — 13 h (oral) presentation — 1 h Σ 180 h
examinations	• (Oral) presentation (50 %) • Report (50 %)
credit points	6 credit points
module begin and duration	summer semester (1 semester)

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language	* please see separate list for the current semester
intake capacity of course/ form of registration	30 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

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module description	**Inorganic Chemistry, Advanced Synthesis and Characterisation**
module code	**Chemie-MV01**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 3rd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	Solid-state and materials chemistry (basic module 1) Bioinorganic chemistry (basic module 2)
course aims	The course covers various aspects of the synthesis, characterisation and reactivity of compounds in the field of inorganic chemistry. Students should gain practical experience in handling such substances and use this experience for the synthesis of new compounds.
content of module	• Synthesis and characterisation of organometallic and simple Werner-type complexes, as well as model substances for metalloproteins • Introduction to the chemistry and synthesis of nano materials • Consolidation of sol-gel-chemistry (“soft chemistry”; chimie douce) • Working methods in inert conditions (Schlenk line, glovebox, glovebags) • Characterisation methods: spectroscopy, diffractometry, electro-chemistry, electron microscope, “stopped-flow” readings
forms of instruction	• practical course (6.4 h/week) • seminar (1.3 h/week)
total workload in hours	<u>practical course</u> attendance hours — 2 * 12 days á 4 h — 96 h preparation, follow-up — 2 h/laboratory course day — 48 h protocols — 2 h/ laboratory course day — 48 h <u>seminar</u> attendance hours — 2 * 10 days á 1 h — 20 h preparation, follow-up — 2 h/attendance hours — 40 h (oral and written) elaboration of presentation — 47 h (oral) presentation — 1 h Σ 300 h
examinations	• Presentation (oral and written) (50%) • Protocols (50%)
credit points	10 credit points
module begin and duration	winter semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	18 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

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module description	**Advanced Organic Chemistry Laboratory Course**
module code	**Chemie-MV02**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semester	MSc chemistry, MSc materials science 3rd semester
module coordinator	Cf. German version
lecturers	lecturers of organic chemistry
course aims	• acquiring knowledge of complex multistage syntheses and working methods in the field of organic chemistry by means of hands-on tutoring • the ability to complete structural analyses of complex organic-chemical compounds • acquiring knowledge of working techniques under an inert atmosphere and at low temperatures; handling highly sensitive substances • interpreting reaction sequences and mechanisms based on one's own test results • maintaining safety at work • presenting research results (presentation and protocols)
content of module	• Teamwork on current research issues • Research-oriented methods of modern organic chemistry • Advanced organic chemical separation techniques • Spectroscopic structural analysis of complex organic molecules and reactive intermediates • Retrosynthesis, stereoselective synthesis • Practising presentation
forms of instruction	• laboratory course (12 h/week) • seminar (0.7 h/week)
examinations	• Final scientific discussion or oral examination (100%); prerequisites: all protocols accepted, successful practise presentation
credit points	10 credit points
prerequisites	basic modules of organic chemistry
workload	laboratory course attendance hours: 180 h preparation, follow-up 90 h seminar attendance hours: 10 h preparation, follow-up 20 h Σ 300 h
module begin and duration	winter semester, 1 semester
language	* please see separate list for the current semester
date	* please see separate list for the current semester
intake capacity of course / form of registration	40 / internet
required literature	* please see separate list for the current semester

module description	**Physical Chemistry of Nanosystems**
module code	**Chemie-MV03**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	BSc chemistry, BSc materials science 3rd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	basic modules of physical chemistry
course aims	Students should … • know central aspects of the synthesis, characterisation and properties of nanosystems that are important for materials science • be able to use common methods of characterisation and analysis of new nanoscale materials
content of module	• Physical chemical preparation methods: self assembling, nanolithography etc. • Nanoparticles and clusters, multilayer systems, quantum wires and quantum dots • Nanomechanics and nanotribology, quantum size effect, thermodynamics of nanoscale systems
forms of instruction	• lecture (2 h/week) • seminar (2 h/week) • laboratory course (2.7 h/week)
total workload in hours	<u>lecture</u> attendance hours — 15 weeks (2 h/week) — 30 h preparation, follow-up — 3 h/attendance hours — 45 h <u>seminar</u> attendance hours — 15 weeks (2 h/week) — 30 h preparation, follow-up — 1 h/attendance hours — 30 h <u>laboratory course</u> attendance hours — 2 weeks, á 20 h — 40 h protocol — 40 h <u>(oral and written) presentation</u> discussion with lecturers 5 weeks á 1 h — 5 h composing written presentation — 48 h preparation of oral presentation — 31 h <u>(oral) presentation</u> — <u>1 h</u> Σ 300 h
examinations	• Presentation (oral and written) (50%) • Protocols (50%)
credit points	10 credit points
module begin and duration	winter semester; 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	40 /internet
date	* please see separate list for the current semester

required literature	* please see separate list for the current semester

module description	**Analytical Methods of Life Sciences**
module code	**Chemie-MV04**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry starting 3rd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	basic modules of analytical chemistry
course aims	Students should be able to: • judge the significance, technical form and application of modern analysis methods • comprehend the interplay of the different methods in specific analytical problems of life sciences • assess the limits of current analytics and new approaches to a solution
content of module	• Advanced methods of bioanalytics • Characterisation of biomolecules • Structural analysis • Database evaluation • Data to knowledge • Obtaining, handling, processing and preparing samples • Characterisation and separation of complex mixtures
forms of instruction	• laboratory course (5.3 h/week) • seminar (1 h/week)
total workload in hours	<u>laboratory course</u> attendance hours — 20 days á 4h — 80 h preparation, follow-up — 2 h/laboratory course day — 40 h writing the protocol — 2 h/laboratory course day — 40 h <u>seminar</u> attendance hours — 1 h/week * 15 weeks — 15 h preparation, follow-up — 2 h/attendance hours — 30 h studying the literature — 70 h composing the report — 10 h preparing the oral presentation — 14 h (oral) presentation — 1 h Σ 300 h
examinations	• (Oral) presentation (50 %) • Report (50 %)
credit points	10 credit points
module begin and duration	winter semester (1 semester)
language	* please see separate list for the current semester
intake capacity of course/ form of registration	15 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Food biotechnology**
module code	**Chemie-MV05**
faculty / subject / department	faculty 08 / food chemistry & chemistry / LCB
applies to degree courses / semesters	MSc chemistry starting 3rd semester
module coordinator	lecturers of Institute for Food Chemistry and Food Biotechnology
advice on the module	* please see separate list for the current semester
prerequisites	admission to MSc chemistry studies
course aims	Students will • learn complex analysis and work techniques in food chemistry and food biotechnology work groups • acquire in-depth knowledge of analytic quality assurance and GLP • present their research results in a presentation and protocols
content of module	• team work on current research issues • research methods of modern food chemistry • food chemistry trace analysis and high-performance analysis processes • culture of microorganisms • cleaning and characterisation of enzymes • Practising presentation
forms of instruction	• laboratory course (12 h/week) • seminar (0.7 h/week)
total workload in hours	<u>laboratory course</u> attendance hours 180 h preparation, follow-up 90 h <u>seminar</u> attendance hours 10 h preparation, follow-up 20 h Σ 300 h
examinations	• final scientific talk or oral examination (30 min) (admission requirements: protocol submitted, successful practise presentation)
credit points	10 credit points
module begin and duration	winter semester / summer semester (1 semester)
language	
intake capacity of course/ form of registration	
date	* please see current timetable of lectures
required literature	* please see separate list for the current semester

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module description	**Chemistry in Confined Spaces**
module code	**Chemie-MS01**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 3rd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	solid-state and materials chemistry (basic module 1) bioinorganic chemistry (basic module 2)
course aims	Students should: • be proficient in the most important concepts for producing porous matrices • know the fundamentals of chemistry in porous matrices • know the basic characterisation methods of porous matrices
content of module	• Fundamentals of the synthesis and characterisation of porous matrices • Introduction to the (nano-)chemistry in porous matrices • Uses of porous matrices
forms of instruction	• practical course (4 h/week) • seminar (1 h/week)
total workload in hours	practical course attendance hours — 20 days á 3 h — 60 h preparation, follow-up — 2h/laboratory course day — 40 h protocols — 3 h/laboratory course day — 60 h seminar attendance hours: — 15 days á 1 h — 15 h preparation, follow-up — 2h/attendance hours — 30 h studying literature — 40 h preparing presentation and final report — 54 h (oral) presentation — 1 h Σ 300 h
examinations	• (Oral) presentation (50%) • Report (50%) (all protocols must be finished before the report.)
credit points	10 credit points
module begin and duration	winter semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	10 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Reactivity of Metals and Ligands**
module code	**Chemie-MS02**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry 3rd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	solid-state and materials chemistry (basic module 1) bioinorganic chemistry (basic module 2)
course aims	Students should: • know the most important concepts of the influence of metal ions on their ligands • know different methods for stoichiometrical or homogenously catalysed reactions of transitory metal complexes (with the exception of organometallic compounds)
content of module	• Influence of metal ions on their ligands • Measuring methods to detect this influence • Template reactions with metal ions in order to synthesize macrocycles, polymers and/or supramolecular compounds • Specific aspects of redox reactions • Specific topics of homogenous catalysis
forms of instruction	• practical course (4 h/week) • seminar (1 h/week)
total workload in hours	practical course attendance hours — 20 days á 3 h — 60 h preparation, follow-up — 2h/laboratory course day — 40 h protocols — 3 h/laboratory course day — 60 h seminar attendance hours — 15 days á 1 h — 15 h preparation, follow-up — 2h/attendance hours — 30 h studying the literature — 40 h preparing the presentation and the final report — 54 h (oral) presentation — 1 h Σ 300 h
examinations	• (Oral) presentation (50%) • Report (50%) (all protocols must be finished before the final report)
credit points	10 credit points
module begin and duration	winter semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	10 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Organic Chemistry Laboratory Course Project**
module code	**Chemie-MS03**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	BSc chemistry, BSc materials science 3rd semester
module coordinator	Cf. German version
advice on the module	NN
lecturers	Cf. German version
prerequisites	basic modules of organic chemistry
course aims	Students should: • familiarise themselves with the scientific research approaches of organic chemistry • develop the ability to independently formulate a scientific question in organic chemistry • formulate and work on research projects
content of module	• Planning research (time, premises, resources) • Research-oriented methods of modern organic chemistry • Practical and theoretical groundwork for research projects • Publication and presentation
forms of instruction	• laboratory course (6.4 h/week)
total workload in hours	laboratory course attendance hours — 12 weeks á 8 h — 96 h preparation, follow-up — 1 h/contact hour — 96 h composing the proposal — 96 h preparation of the presentation — 10 h and defence 2 h 12 h Σ 300 h
examinations	• Report in the form of a research project formulated according to the standard DFG form (DFG-Sachbeihilfemuster) (60%) • (Oral) presentation (40%)
credit points	10 credit points
module begin and duration	winter semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	40 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

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module description	**Physical Chemistry Project**
module code	**Chemie-MS04**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 3rd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	basic modules of physical chemistry
course aims	Students should have a command of scientific methods and techniques that enable project-oriented work on modern issues of physical chemistry.
content of module	• Varying issues of research within the context of physical chemistry • Developing experimental and theoretical concepts of physical chemistry • Planning a scientific work schedule • Estimating the financial and personnel resources required • Relating the research project to current literature • The final report should be comparable to a DFG application in detail and quality
forms of instruction	• practical course (5.3 h/week) • project work (0.7 h/week)
total workload in hours	practical course attendance hours — 4 weeks á 20 h — 80 h project work talks with the lecturers — 5 weeks á 2 h — 10 h studying literature, gathering information — 120 h presentation/defence (including preparation time) — 40 h written report — 50 h Σ 300 h
examinations	• (Oral) presentation (50 %) • Report (50 %)
credit points	10 credit points
module begin and duration	winter semester; 1 semester
language	please see separate list for the current semester
intake capacity of course/ form of registration	10 /internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

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module description	**Proteomics + Toponomics**
module code	**Chemie-MS05**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry starting 3rd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	basic modules of analytic chemistry
course aims	Students should: • become familiar with and be able to apply analytical processes of characterising proteins and proteomes • be able to utilise imaging processes of microscopy and microprobe analysis • assess requirements and limits of protein analysis
content of module	• Gel permeation chromatography • Enzymatic proteolysis • Protein identification • Marking methods • Quantification methods • Fluorescence microscopy • Imaging micro-probe mass spectrometry • High-resolution mass spectrometry
forms of instruction	• laboratory course (4 h/week) • seminar (1 h/week)
total workload in hours	<u>laboratory course</u> attendance hours — 20 days á 3h — 60 h preparation, follow-up — 2 h/laboratory course day — 40 h evaluation, writing protocols — 3 h/laboratory course day — 60 h <u>seminar</u> attendance hours — 1 h/week * 15 weeks — 15 h preparation, follow-up — 2 h/attendance hours — 30 h studying literature — 80 h writing the report — 15 h Σ 300 h
examinations	Report (100 %)
credit points	10 credit points
module begin and duration	winter semester (1 semester)
language	* please see separate list for the current semester
intake capacity of course/ form of registration	15 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Biochemistry of nucleic acids**
module code	**Chemie-MS06**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry 3rd semester
module coordinator	Cf. German version
advice on the module	Cf. German version
lecturers	professors of biochemistry
prerequisites	desirable: Advanced module Chemie-MV-04: "Analytical methods of Life Sciences"
course aims	Students should be able to: • carry out teamwork on a current problem in biochemistry of nucleic acids • comprehend the interaction between various methods as illustrated by a specific problem in biochemistry of nucleic acids • become familiar with the relevant English literature
content of module	• enzymology of proteins that interact with DNA and RNA • modern methods for investigating interaction between protein- nucleic acid and protein-protein
forms of instruction	• laboratory course • seminar
examinations	• final paper (80 %) • seminar (20 %)
credit points	10 credit points
workload	<u>laboratory course</u> attendance hours — 20 days á 5 h — 100 h preparation, follow-up — 2 h/laboratory course day — 40 h protocols — 1 h/ laboratory course day — 20 h <u>seminar</u> attendance hours — 1 h * 15 weeks — 15 h preparation, follow-up — 2 h/attendance hours — 30 h study of literature — 80 h <u>seminar paper and final report</u> — 15 h Σ 300 h
module begin and duration	winter semester; 1 semester
language	please see separate list for the current semester
intake capacity / form of registration	4
date	please see separate list for the current semester
required literature	project specific

module description	**Food chemistry laboratory course project**
module code	**Chemie-MS07**
faculty / subject / department	faculty 08 / chemistry / food chemistry & food biotechnology
applies to degree courses / semesters	MSc chemistry starting 3rd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
prerequisites	none
course aims	Students should: • become familiar with concepts of food chemistry research • acquire the ability to independently formulate a scientific problem in food chemistry • be able to define and plan a research project
content of module	• research planning (time, premises, resources) • research methods of modern food chemistry and food analytics • practical and theoretical groundwork for research project • publication and presentation
forms of instruction	• project work / laboratory course (6.4 h/week)
total workload in hours	Project work attendance hours 96 h preparation, follow-up 96 h non-supervised work 96 h examination incl. preparation 12 h Σ 300 h
examinations	Written report (60 %) and oral presentation (40 %) Repeat examination: written report, oral presentation
credit points	10 credit points
module begin and duration	every semester (1 semester)
language	German / English
intake capacity of course	15
date	* please see timetable of lectures for the current semester
required literature	* please see separate list for the current semester

module description	**Master thesis**
module code	**Chemie-MS08**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry 4th semester
module coordinator	lecturers of the chemistry departments
advice on the module	* please see separate list for the current semester
prerequisites	compulsory modules of basic courses
course aims	Students should: • become competent in applying scientific methods to a given chemistry problem and presenting and defending their findings
content of module	• conception of a work schedule • working through literature • evaluation of measurement and analysis methods, implementation and evaluation, discussion of results • writing the thesis
forms of instruction	• all-day instruction, working in a scientific team
total workload in hours	22.5 weeks full-time 900 h Σ 900 h
examinations	• dissertation (thesis) (70 %) • oral presentation (defence) (30 %)
credit points	30 credit points
module begin and duration	summer semester (1 semester)
language	* please see separate list for the current semester
intake capacity of course / form of registration	30 / internet
date	* please see timetable of lectures for the current semester
required literature	* please see separate list for the current semester

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module description	**Nanochemistry**
module code	**Chemie-MW01**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • possess advanced knowledge of the concepts needed to describe the chemical and physical properties of modern nanostructured materials • possess knowledge of the relationships between structure and properties of nanoparticles • have an overview of the methods used for characterization • have gathered experience with the complex preparatory methods needed to describe nanostructured materials
content of module	• Synthesis, structure and properties of nanoparticles • Introduction to colloid chemistry • laboratory course on preparing nanostructured materials
forms of instruction	• lecture (1 h/week) • seminar (0.7 h/week) • practical course (2.7 h/week)
total workload in hours	<u>lecture</u> attendance hours — 1 h/week *15 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h <u>practical course</u> attendance hours — 10 days á 4 h — 40 h preparation, follow-up — 1 h/laboratory course day — 10 h protocols — 2 h/ laboratory course day — 20 h <u>seminar</u> attendance hours — 10 days á 1 h — 10 h preparation, follow-up — 1 h/attendance hours — 10 h presentation and elaboration — 38 h <u>written examination</u> preparation for written examination — 20 h written examination — 2 h Σ 180 h
examinations	• Written examination or oral examination (60%) (admission requirement to written examination: completion of all protocols and presentations) Presentation (oral and written) (40%)
credit points	6 credit points
module begin and duration	summer semester, 1 semester
language	* please see separate list for the current semester

intake capacity of course/ form of registration	10 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

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module description	**Modern Concepts of Inorganic Chemistry**
module code	**Chemie-MW02**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • have knowledge of modern concepts of inorganic chemistry possess knowledge of the relationships between synthesis, structure and properties of selected inorganic compounds • have an overview of the materials necessary for characterisation
content of module	• Modern concepts of inorganic chemistry (e.g. synthesis under extraordinary circumstances (microwave radiation, under high pressure, in supercritical fluids, sonochemistry) • Self-organisation of matter • Surface refinement • Hybrid materials
forms of instruction	• lecture (1 h/week) • seminar (1.3 h/week)
total workload in hours	<u>lecture</u> attendance hours — 1 h/week *15 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h <u>seminar</u> attendance hours — 10 days á 2 h — 20 h preparation, follow-up — 1 h/attendance hours — 20 h presentation and elaboration — 88 h <u>written examination</u> preparation for written examination — 20 h written examination — 2 h Σ 180 h
examinations	• Written examination or oral examination (60%) (admission requirement to written examination: successful completion of presentation) • Presentation (oral and writen) (40%)
credit points	6 credit points
module begin and duration	summer semester, 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	15 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Inorganic Reaction Mechanisms**
module code	**Chemie-MW 03**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 1st semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • know the most important aspects of inorganic reaction mechanisms • know the different types of chemical reactions (ligand exchange and electron transfer) • inorganic photochemistry • possess in-depth knowledge of the analysis of reaction mechanisms in inorganic chemistry
content of module	• Associative, dissociative and interchange ligand exchange reactions • Redox reactions (inner sphere and outer sphere mechanism, Marcus theory) • Interconnection of concentrations, temperature, pressure and the reaction mechanism (activation parameters) • Methods of determining reaction mechanisms (UV/Vis spectroscopy, stopped-flow, relaxation methods) • Evaluation programmes (global analysis) for kinetic measurings and data analysis
forms of instruction	• lecture (1 h/week) • seminar (0.7 h/week) • practical course (2,7 h/week)
total workload in hours	<u>lecture</u> attendance hours — 1 h/week * 15 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h <u>practical course</u> attendance hours — 10 days á 4 h — 40 h preparation, follow-up — 1 h/laboratory course day — 10 h protocols — 2 h/laboratory course day — 20 h <u>seminar</u> attendance hours — 10 days á 1 h — 10 h preparation, follow-up — 1 h/attendance hours — 10 h presentation and elaboration — 38 h <u>written examination</u> preparation for written examination — 20 h written examination — 2 h Σ 180 h
examinations	• Written examination or oral examination (60%) (admission requirement to written examination: completion of all protocols and presentations) • Presentation (oral and written) (40%)
credit points	6 credit points
module begin and duration	winter semester, 1 semester
language	* please see separate list for the current semester

intake capacity of course/ form of registration	10 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Organic Chemistry: Computational Chemistry/Molecular Modelling**
module code	**Chemie-MW 04**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • receive a practical and theoretical introduction to computational chemistry and molecular modelling • acquire knowledge of typical procedures in computational chemistry by means of case studies • be able to select simple computerised methods for work on organic-chemical or biochemical problems and apply them accordingly
content of module	• History of computational chemistry/molecular modelling • Literature and internet (re)sources • Comparison of computational with experimental results • Molecular coordinates • Potential energy hypersurfaces and energy minimization • Computer hardware and software considerations • Force fields (molecular mechanics) • Strain and conformational analysis • Qualitative construction of molecular orbitals, perconjugation, anomeric effect etc. • Molecular orbitals: qualitative considerations • Semiempirical theory • Basis sets • Electron correlation (methods) • Density functional theory: applications • Molecular properties • Solvent effects • Simulating spectra: IR, Raman, NMR, UV, CD etc. • Quantitative structure-activity relationships (QSAR)
forms of instruction	• lecture (2 h/week) • practical course (2 h/week)
total workload in hours	lecture attendance hours — 2 h/week * 15 weeks — 30 h preparation, follow-up — 2 h/attendance hours — 60 h practical courses attendance hours — 3 h/week * 10 weeks — 30 h preparation, follow-up — 1 h/attendance hours — 30 h preparing and composing report — 30 h Σ 180 h
examinations	• Report in the form of a scientific publication (in English) (100%)
credit points	6 credit points
module begin and duration	summer semester, 1 semester
language	* please see separate list for the current semester

intake capacity of course/ form of registration	30 / internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Matrix Isolation –Reactive Intermediates**
module code	**Chemie-MW 05**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • understand principles of matrix isolation • develop the ability to autonomously conduct experiments in matrix isolation conditions • gain the ability to calculate molecule data by means of quantum mechanical methods to support spectrum analysis on the basis of matrix measuring • be able to document and present results
content of module	• Matrix isolation, preparing samples, assembling instruments, systems for controlling vacuum and temperature • Synthesis of suitable preliminary stages for creating highly reactive and hitherto unknown molecules and intermediates in matrix isolation conditions • Synthesis and spectroscopy of reactive intermediates in matrices, autonomous readings and interpretations • Quantum mechanical calculations of IR, UV/Vis spectroscopic data
forms of instruction	• laboratory course (2.7 h/week) • seminar (0.7 h/week)
total workload in hours	<u>laboratory course</u> attendance hours — 4 h/week * 10 weeks — 40 h preparation, follow-up — 1,5 h/attendance hours — 60 h protocols — 1 h/attendance hours — 40 h <u>seminar</u> attendance hours: — 1 h/week * 10 weeks — 10 h preparation, follow-up — 1 h/attendance hours — 10 h preparing the (oral) presentation — 19 h (oral) presentation — 1 h Σ 180 h
examinations	• Protocols (60%) • Final (oral) presentation(40%) in the seminar
credit points	6 credit points
module begin and duration	summer semester; 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	10 /internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Scientific Writing and Data Dissemination**
module code	**Chemie-MW 06**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 1st semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • acquire knowledge of elements of scientific publications • be able to handle modern information technology (data bases, search engines etc.) • acquire the ability to independently define and document a research project • be able to draft research projects and their respective schedules with regard to work and time • be able to present results
content of module	• Analysis of scientific publications • Presenting individual investigation and research results • Foreign language phrases and peculiarities • Subject-specific scientific English • Software for data acquisition and processing
forms of instruction	• practical courses (2 h/week) • seminar (2 h/week)
total workload in hours	<u>practical courses</u> attendance hours — 2 h/week * 14 weeks — 28 h preparation, follow-up — 1 h/attendance hours — 28 h <u>seminar</u> attendance hours — 2 h/week * 14 weeks — 28 h preparation, follow-up — 68 h preparation time for the report and the presentation — 28 h Σ 180 h
examinations	• Report to present investigation or research results in the form of a scientific publication or an application for scientific funding (60%) • Presenting the results (in an oral presentation or in written form as a website) (40%)
credit points	6 credit points
module begin and duration	winter semester; 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	30 /internet
date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

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module description	**Modern Aspects of Physical Chemistry**
module code	**Chemie-MW07**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 1st semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	The course seeks to introduce students to the current literature of physical chemistry and aims to work on modern research issues.
content of module	• Modern experimental and theoretical methods such as femtochemistry, molecular dynamic calculations and nanotechnology • Aspects of modern research in the field of physical chemistry on the basis of current literature
forms of instruction	• seminar (2 h/week) • practical course (1 h/week)
total workload in hours	practical course attendance hours — 15 weeks (1 h/week) — 15 h preparation, follow-up — 4 h/attendance hours — 60 h seminar attendance hours — 15 weeks (2 h/week) — 30 h preparation, follow-up — 1 h/attendance hours — 30 h oral examination — 1 h composing the written elaboration — 44 h Σ 180 h
examinations	• (Oral and written) presentation (50%) • Oral examination (50%) Both partial exams must be passed.
credit points	6 credit points
module begin and duration	winter semester; 1 semester
language	please see separate list for the current semester
intake capacity of course/ form of registration	40 /internet
Date	please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Theoretical Concepts of Physical Chemistry**
module code	**Chemie-MW08**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should have a command of basic theoretical concepts of physical chemistry and be able to apply them to interesting chemical reactions and systems.
content of module	• Mathematical methods • Transport phenomena • Electron theory, including statistics • Consolidating chemical bonds: symmetries and frontier orbitals • Monte Carlo simulations • Molecular dynamics • Non-linear dynamics • Computer experiments • FEM laboratory: finite elements
forms of instruction	• lecture (2 h/week) • seminar (2 h/week)
total workload in hours	lecture attendance hours — 15 weeks (2h/week) — 30 h preparation, follow-up — 0.8 h/lecture day — 24 h seminar attendance hours — 15 weeks (2 h/week) — 30 h preparation, follow-up — 2 h/seminar day — 30 h preparation of the presentation — 44 h written examination preparation for written examination — 20 h written examination — 2 h Σ 180 h
examinations	• (Oral) presentation (50%) • Written examination (50%) Both partial exams must be passed.
credit points	6 credit points
module begin and duration	summer semester; 1 semester
language	please see separate list for the current semester
intake capacity of course/ form of registration	40 /internet
date	please see separate list for the current semester
required literature	* please see separate list for the current semester

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module description	**Applied Electrochemistry**
module code	**Chemie-MW09**
faculty / subject / department	faculty 08 / chemistry
applies to degree courses / semesters	MSc chemistry, MSc materials science 2nd semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should: • know the most important application areas of electrochemical processes • know the most frequently used experimental methods • be able to handle the theoretical concepts of electrochemistry and comprehend them as an essential element of numerous physical-chemical issues • acquire advanced knowledge of current research trends in (solid-state) electrochemistry • acquire consolidated knowledge of the basics of electrochemical energy technology
content of module	• Thermodynamic and kinetic basics of electrochemistry • Interphase phenomenon • Experimental methods • Application areas: battery and fuel cell technology, sensor technology etc. • Electrochemistry and solid-state chemistry, solid state ionics
forms of instruction	• lecture (1 h/week) • practical course (1 h/week) • laboratory course (4 h/week)
total workload in hours	<u>lecture</u> attendance hours — 2 h/week * 7,5 weeks — 15 h preparation, follow-up — 1 h/attendance hours — 15 h <u>laboratory course</u> attendance hours — 2 weeks * 20 h — 40 h protocol — 48 h <u>practical course</u> attendance hours — 2 h/week * 7,5 weeks — 15 h preparation, follow-up — 2 h/attendance hours — 30 h <u>written examination</u> preparation for written examination — 15 h written examination — 2 h Σ 180 h
examinations	• Written examination (50%) • Protocols (50%)
credit points	6 credit points
module begin and duration	summer semester; 1 semester
language	* please see separate list for the current semester
intake capacity of course/ form of registration	30 / internet

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date	* please see separate list for the current semester
required literature	* please see separate list for the current semester

module description	**Business Establishment and Management**
module code	**Chemie-MW 10**
faculty / subject / department	FH Gießen-Friedberg
applies to degree courses / semesters	possibly biology, chemistry, physics, degree courses of the FH 1st semester
module coordinator	Cf. German version
advice on the module	* please see separate list for the current semester
lecturers	Cf. German version
prerequisites	none
course aims	Students should • be familiar with the prerequisites for successfully establishing and managing a business • possess the subject-specific knowledge of business administration basics necessary for taking on responsible positions in an enterprise • know essential methods of management • possess essential knowledge of the prerequisites for a successful start into self-employment • possess practical experience in theoretically conveyed basics
content of module	• Business administration compendium (theoretical fundamentals of establishing and managing businesses) • Project work, as far as possible with alternative thematic foci: o Innovation management o Planning establishment of a business o Business development o Personnel management
forms of instruction	• Lecture and (tutored) teamwork • Theoretical groundwork is always followed by specific practical application of what has been learned by the students • Teamwork helps to train essential soft skills in a “learning by doing” approach
total workload in hours	<u>lecture</u> attendance hours — 4 days á 4 h — 16 h preparation, follow-up — 1 h/lecture day — 4 h <u>project work</u> teamwork — 8 h á 10 weeks — 80 h talks with the lecturers — 2 h á 5 weeks — 10 h composing the written elaboration — 45 h preparation of the presentation — 20 h presentation (of own results and those of the other groups — 5 h Σ 180 h
examinations	• Report (60%) • (Oral) presentation (40 %)
module begin and duration	once a year 1 semester
language	German
intake capacity of course/ form of registration	no more than 25 students per semester
date	* please see separate list for the current semester

required literature	* please see separate list for the current semester