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|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Modulbezeichnung:</b> Catalysis (CME2)<br>(Catalysis) | <b>15 ECTS</b>                                                                                                                                                                                         |                              |
| Modulverantwortliche/r:                                  | Hans-Peter Steinrück                                                                                                                                                                                   |                              |
| Lehrende:                                                | Wilhelm Schwieger, Svetlana Tsogoeva, Sjoerd Harder, Jörg Libuda, Bernd Meyer, Andriy Mokhir, Peter Schulz, Julien Bachmann, Marlene Scheuermeyer, Hans-Peter Steinrück, Thomas Drewello, Romano Dorta |                              |
| Startsemester: WS 2016/2017                              | Dauer: 2 Semester                                                                                                                                                                                      | Turnus: halbjährlich (WS+SS) |
| Präsenzzeit: 195 Std.                                    | Eigenstudium: 255 Std.                                                                                                                                                                                 | Sprache: Englisch            |

### Lehrveranstaltungen:

#### **A: Lectures and seminars**

Two units per 2L + 1S from the offers A1 - A8 chosen by the student.

One of the two units can be replaced either by an equivalent multidisciplinary course with a total of 5 ECTS from the field of "Erlangen Catalysis Resource Center" (ECRC) (e.g. A9 and A10) or by courses from the modules "Interfaces" or "Molecular Nanoscience".

#### **A1: N. N.**

#### **A2: Nanoparticles and nanostructured thin films (WS)**

Nanoparticles and Nanostructured Thin Films / Nanopartikel und nanostrukturierte dünne Schichten (WS 2016/2017, Vorlesung, 2 SWS, Julien Bachmann)

#### **A3: Organocatalysis (SS)**

Organocatalysis (SS 2017, Vorlesung, 2 SWS, Svetlana Tsogoeva)

Organocatalysis - Seminar (SS 2017, Seminar, 1 SWS, Svetlana Tsogoeva)

#### **A4: Catalysis and kinetics (SS)**

Catalysis and Kinetics (SS 2017, Vorlesung, 2 SWS, Jörg Libuda)

Seminar Catalysis and Kinetics (SS 2017, Seminar, 1 SWS, Jörg Libuda et al.)

#### **A5: Chemical reactions in the presence of nucleic acid-based catalysts (SS)**

Chemical reactions in the presence of nucleic acid-based catalysts (SS 2017, Vorlesung, Andriy Mokhir)

Chemical reactions in the presence of nucleic acid-based catalysts (SS 2017, Seminar, Andriy Mokhir)

#### **A6: Catalytic reactions with transition metals (SS)**

Catalytic reactions with transition metals (SS 2017, Vorlesung, 2 SWS, Sjoerd Harder et al.)

Catalytic reactions with transition metals (SS 2017, Seminar, 1 SWS, Romano Dorta et al.)

#### **A7: Modeling of catalytic processes (SS)**

Modeling of Catalytic Processes (SS 2017, Vorlesung, 2 SWS, Bernd Meyer)

Modeling of Catalytic Processes (Praktikum) (SS 2017, Praktikum, 2 SWS, Bernd Meyer et al.)

#### **A8: Modern methods in mass spectrometry (WS)**

Modern Methods in Mass Spectrometry (WS 2016/2017, Vorlesung, 2 SWS, Thomas Drewello)

Seminar Modern Methods in Mass Spectrometry (WS 2016/2017, Seminar, 1 SWS, Thomas Drewello et al.)

#### **A9: Lösungsmittelkonzepte für katalytische Verfahren (WS)**

Lösungsmittelkonzepte für katalytische Verfahren (WS 2016/2017, Vorlesung, 2 SWS, Peter Schulz)

Lösungsmittelkonzepte für katalytische Verfahren (WS 2016/2017, Übung, 1 SWS, Marlene Scheuermeyer et al.)

#### **A10: Technische Katalyse und Adsorption (SS)**

Technische Katalyse und Adsorption / Technical Catalysis and Adsorption (SS 2017, Vorlesung, 2 SWS, Wilhelm Schwieger)

Übungen zu Technische Katalyse und Adsorption (SS 2017, Übung, 1 SWS, Wilhelm Schwieger et al.)

#### **B: Lab course in one of the lecturers working groups A1-A8 at the Department of Chemistry and Pharmacy (7 LAB)**

Attendance in lab course is compulsory!

Lab Course Catalysis (WS 2016/2017, Praktikum, 7 SWS, Hans-Peter Steinrück et al.)

Lab Course Catalysis (SS 2017, Praktikum, 7 SWS, Hans-Peter Steinrück et al.)

### Inhalt:

- developing the basics of catalysis at the level of a scientifically oriented Master's program

- introduction to the current issues of research in the field of catalysis
- deepening of knowledge in a specialized field of catalysis of lecturers involved in the ECRC to the limit of current knowledge
- experimental studies on selected chapters of catalysis at an advanced level

**Lernziele und Kompetenzen:**

Students

- explain the basics of catalysis
- present and compare basics of different modern experimental or theoretical methods in catalysis
- apply basic knowledge to current issues in research
- analyse experimental data and interpret results referring to literature data independently
- apply model-like descriptions for complex systems and model experimental data

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**Studien-/Prüfungsleistungen:**

Katalyse (Prüfungsnummer: 65401)

(englische Bezeichnung: Oral Examination or Examination (Klausur) on Catalysis)

Prüfungsleistung, mündliche Prüfung, Dauer (in Minuten): 45

Anteil an der Berechnung der Modulnote: 100%

weitere Erläuterungen:

O45, 2 examiners (PL)

EX (SL)

EX (SL) LAB (SL)

Grading procedure: Result of the oral examination (100%)

Prüfungssprache: Englisch

Erstablingung: WS 2016/2017, 1. Wdh.: SS 2017

1. Prüfer: Julien Bachmann

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**Bemerkungen:**

**Module compatibility:** M.Sc. Chemie / M.Sc. Molecular Science (Elective module)

**Teaching and examination language:** English, except A9 and A10 (both in German!)