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**Modulbezeichnung:** Catalysis (CME2) 15 ECTS  
 (Catalysis)

Modulverantwortliche/r: Hans-Peter Steinrück

Lehrende: Julien Bachmann, Svetlana Tsogoeva, Wilhelm Schwieger, Assistenten, Thomas Drewello, Romano Dorta, Sjoerd Harder, Jörg Libuda, Andriy Mokhir, Hans-Peter Steinrück, Bernd Meyer

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Startsemester: WS 2015/2016	Dauer: 2 Semester	Turnus: halbjährlich (WS+SS)
Präsenzzeit: 195 Std.	Eigenstudium: 255 Std.	Sprache: Englisch

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**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 2015/2016, Vorlesung, 2 SWS, Julien Bachmann)

**A3: Organocatalysis (SS)**

Organocatalysis (SS 2016, Vorlesung, 2 SWS, Svetlana Tsogoeva)

Organocatalysis - Seminar (SS 2016, Seminar, 1 SWS, Svetlana Tsogoeva)

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

Catalysis and Kinetics (SS 2016, Vorlesung, 2 SWS, Jörg Libuda)

Seminar Catalysis and Kinetics (SS 2016, 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 2016, Vorlesung, Andriy Mokhir)

Chemical reactions in the presence of nucleic acid-based catalysts (SS 2016, Seminar, Andriy Mokhir)

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

Catalytic reactions with transition metals (SS 2016, Vorlesung, 2 SWS, Sjoerd Harder et al.)

Catalytic reactions with transition metals (SS 2016, Seminar, 1 SWS, Romano Dorta et al.)

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

Modeling of Catalytic Processes (SS 2016, Vorlesung, 2 SWS, Bernd Meyer)

Modeling of Catalytic Processes (Praktikum) (SS 2016, Praktikum, 2 SWS, Bernd Meyer et al.)

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

Modern Methods in Mass Spectrometry (WS 2015/2016, Vorlesung, 2 SWS, Thomas Drewello)

Seminar Modern Methods in Mass Spectrometry (WS 2015/2016, Seminar, 1 SWS, Thomas Drewello et al.)

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

Lösungsmittelkonzepte für katalytische Verfahren (WS 2015/2016, Vorlesung, 2 SWS, Peter Schulz)

Lösungsmittelkonzepte für katalytische Verfahren (WS 2015/2016, Übung, 1 SWS, Martin Lijewski)

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

Technische Katalyse und Adsorption / Technical Catalysis and Adsorption (SS 2016, Vorlesung, 2 SWS, Wilhelm Schwieger)

Übungen zu Technische Katalyse und Adsorption (SS 2016, 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)**

Lab Course Catalysis (WS 2015/2016, Praktikum, 7 SWS, Hans-Peter Steinrück et al.)

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

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**Empfohlene Voraussetzungen:**

Admission to the M.Sc. program Chemistry

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**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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#### **Verwendbarkeit des Moduls / Einpassung in den Musterstudienplan:**

Das Modul ist im Kontext der folgenden Studienfächer/Vertiefungsrichtungen verwendbar:

[1] **Molecular Science (Master of Science): 1-3. Semester**

(Po-Vers. 2013 | Wahlmodul Molecular Science)

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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:

PL: oral exam 45 (O45) 2 examiners

EX (SL) EX (SL) LAB (SL, AP)

Calculation of the grade for the module: Result of the oral exam (100%)

Prüfungssprache: Englisch

Erstablesung: WS 2015/2016, 1. Wdh.: SS 2016

1. Prüfer: Hans-Peter Steinrück

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#### **Organisatorisches:**

**Intended stage in the degree course:** semester 1. and 2.

#### **Bemerkungen:**

**Language:** English, except A9 and A10 (both in German!)