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**Modulbezeichnung:** Interfaces and Catalysis - Lab (IntCat-Lab) 5 ECTS  
 (Interfaces and Catalysis - Lab)

Modulverantwortliche/r: Jörg Libuda

Lehrende: Jörg Libuda, Dozenten der beteiligten Fachgebiete

Startsemester: SS 2022

Dauer: 1 semester

Turnus: halbjährlich (WS+SS)

Präsenzzeit: 105 Std.

Eigenstudium: 45 Std.

Sprache: Englisch

### Lehrveranstaltungen:

- Attendance in lab course is compulsory!
- Attendance at safety instructions is compulsory!
- Attendance in winter or summer term possible!
- A valid laboratory insurance is mandatory for participation in the lab course - see: [www.laborversicherung.de](http://www.laborversicherung.de)

Interface & Catalysis LAB (SS 2022, Vorlesung, 7 SWS, Jörg Libuda et al.)

### Inhalt:

Practical introduction to state-of-the-art research in the fields of surface science, interface science, heterogeneous catalysis, electrocatalysis or materials characterization. Guided work on a current research project in a research group. Research topics may cover spectroscopy at surfaces, microscopy at surfaces, in-situ or operando spectroscopy, characterization of catalytic materials, in-situ methods in electrocatalysis, preparation and characterization of nanomaterials, modelling and simulation of interfaces and nanomaterials or similar. Practical laboratory experience to introduce state-of-the-art experimental tools in surface and catalysis research, among them:

- Electron spectroscopies
- Vibrational spectroscopies
- Microscopy at interfaces
- Other characterization methods for surfaces / interfaces
- In-situ and operando spectroscopy and microscopy
- Characterization of nanomaterials
- Electrochemical in-situ characterization
- Photochemical / photoelectrochemical in-situ characterization
- Modelling on processes at interfaces

### Lernziele und Kompetenzen:

The students ...

- get familiar with the current state-of-knowledge for a specific research topic.
- apply fundamental knowledge of physical chemistry to a specific research topic.
- understand and test model-like descriptions for complex physicochemical problems.
- operate complex state-of-the-art instrumentation.
- get in contact with development of new methodologies to answer open questions in interface science and catalysis.
- analyze data with state-of-the-art methodologies.
- record, document, and analyze research data in in appropriate form.
- present and discuss experimental results and develop interpretations.
- present own results in written form and scientific style English language.

### Literatur:

Will be provided by the supervising research group

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

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

#### [1] Chemistry (Master of Science)

(Po-Vers. 2020w | NatFak | Chemistry (Master of Science) | Ergänzende Wahlpflichtmodule | Advances in Interface Research and Catalysis A | Interfaces and Catalysis - Lab)

#### [2] Chemistry (Master of Science)

(Po-Vers. 2020w | NatFak | Chemistry (Master of Science) | Ergänzende Wahlpflichtmodule | Advances in Interface Research and Catalysis B | Interfaces and Catalysis - Lab)

Dieses Modul ist daneben auch in den Studienfächern "Molecular Science (Master of Science)" verwendbar.

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### **Studien-/Prüfungsleistungen:**

Interfaces and Catalysis - Lab (Prüfungsnummer: 65341)

Prüfungsleistung, Praktikumsleistung

Anteil an der Berechnung der Modulnote: 100%

weitere Erläuterungen:

Graded Lab Protocol of 30 - 50 pages (plus raw data documentation)

Prüfungssprache: Englisch

Erstablingung: SS 2022, 1. Wdh.: WS 2022/2023

1. Prüfer: Jörg Libuda

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### **Organisatorisches:**

#### **Please note:**

- Students contact the research research groups of their choice in the field of interface science, interface controlled materials, heterogeneous catalysis and electrocatalysis, nanomaterials characterization, or modelling and simulation of processes at interfaces at the Department of Chemistry and Pharmacy.
- Time and place by appointment (winter or summer term)
- Central Registration via Studon: [https://www.studon.fau.de/crs4211909\\_join.html](https://www.studon.fau.de/crs4211909_join.html)
- All organization information available vis Studon: <https://www.studon.fau.de/crs4211909.html>
- Module examination organized by supervising group
- Attendance in lab course is compulsory!
- Please check lab instructions (contact lab supervisor)
- Laboratory insurance is mandatory for participation in the lab course - see: [www.laborversicherung.de](http://www.laborversicherung.de)

### **Bemerkungen:**

Module compatibility:

- Obligatory lab course module (5 ECTS) within the Compulsory elective module **Interfaces and Catalysis** within the degree programmes M.Sc. Chemistry or M.Sc. Molecular Science