

**Modulbezeichnung:** **Semiconductor Materials for Energy Applications (EnMat-3)** 5 ECTS  
(Semiconductor Materials for Energy Applications)

Modulverantwortliche/r: Dirk M. Guldi

Lehrende: Julien Bachmann, u. Mitarbeiter

Startsemester: SS 2022

Dauer: 1 Semester

Turnus: jährlich (SS)

Präsenzzeit: 45 Std.

Eigenstudium: 105 Std.

Sprache: Englisch

### Lehrveranstaltungen:

Semiconductor Materials for Energy Applications (SS 2022, Seminar, Ryan Crisp)

Semiconductor Materials for Energy Applications - Seminar (SS 2022, Seminar, 1 SWS, Ryan Crisp)

### Inhalt:

- Fundamentals of semiconductors: Crystal structure, Electronic structure, Electrical transport, Interaction with light
- Semiconductor devices: Tunnelling, The pn junction, The transistor
- Photovoltaics: Principles, Types of solar cells
- The interface to a solution: Charged electrolytic interfaces, Electrocatalysis and photoelectrocatalysis

### Lernziele und Kompetenzen:

The students

- are familiar with the fundamentals and modern developments in semiconductor science and applications
- understand theoretical and practical aspects in state-of-the-art semiconductor devices
- can present, communicate and discuss scientific results with experts in English.

### 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 Energy Materials | Semiconductor Materials for Energy Applications)

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

(Po-Vers. 2020w | NatFak | Chemistry (Master of Science) | Wahlmodule | Semiconductor Materials for Energy Applications)

#### [3] Molecular Science (Master of Science)

(Po-Vers. 2020w | NatFak | Molecular Science (Master of Science) | Compulsory elective module | Advances in Energy Materials | Semiconductor Materials for Energy Applications)

#### [4] Molecular Science (Master of Science)

(Po-Vers. 2020w | NatFak | Molecular Science (Master of Science) | Elective modules | Semiconductor Materials for Energy Applications)

### Studien-/Prüfungsleistungen:

Semiconductor Materials for Energy Applications (Prüfungsnummer: 65411)

(englische Bezeichnung: Semiconductor materials for energy applications)

Prüfungsleistung, mündliche Prüfung, Dauer (in Minuten): 20

Anteil an der Berechnung der Modulnote: 100% Prüfungssprache: Englisch

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

1. Prüfer: Julien Bachmann

### Organisatorisches:

Please note:

- Students have to register for the module on StudOn (check registration periods)!
- Registration/further information via StudOn

**Bemerkungen:**

Module compatibility:

- within the Compulsory Elective Module "Advances in Energy Materials" in M. Sc. Chemistry or M. Sc. Molecular Science (20 ECTS)
- part of the Elective Module in M. Sc. Chemistry or M. Sc. Molecular Science (5 ECTS, not graded)