

## Teaching in STEM disciplines: Methods and research results

(also part of the SU-University Didactics Programme, module: electives of higher education didactics competencies)

**Target group:** academic teachers and scientists

How can courses in STEM fields be taught in an interactive way, even with large numbers of students? What methods can be used, both in face-to-face and in online instruction? How can results from discipline-based educational research (DBER) support instructors and contribute to improvements in teaching effectiveness?

This workshop offers insights into methods and results of educational research in introductory science and engineering courses. As suggested by these findings, teaching methods that allow students to participate actively (even in large lectures of 400 students or more) have a greater chance of achieving substantial student learning gains and generate true understanding. Among the methods presented in the workshop are:

- Peer Instruction (PI) – a format to have students think about, discuss and answer specifically designed multiple-choice questions
- Just-in-Time Teaching (JiTT) – a specific type of inverted classroom setting, that uses students' answers to preparatory questions to focus instruction on particularly difficult points without requiring additional lecture time
- Tutorials – collaborative-group worksheets that anticipate typical difficulties and help students overcome these

Participants in this workshop will have the opportunity to experience these methods themselves and to adapt some of them for their own teaching situation. In addition, we will discuss what factors affect or hinder the success of these methods.

**Lecturer:** Prof. Dr. Christian Kautz, TU Hamburg, Engineering Education Research

**Single course, programme, certificate:** You can also attend the workshop as an individual seminar regardless of the subsequent certificate. For the full and dedicated attendance of an single course from 5 work units you will receive a competence-based proof of participation from the Division for University Didactics at Saarland University. This workshop is one of the workshops of the module "Electives of Higher Education Didactics Competencies" of the Saarland University's Certificate of Teaching in Higher Education.

The certificate comprises a total of three modules (modules: core workshops of higher education competencies, electives of higher education competencies, collegial coaching and teaching portfolio) at least 120 work units or at least 3x40 work units.

**Programme and Certificate Responsible:** Birgit Roßmanith

**Registration and further information at:**

<http://www.uni-saarland.de/hochschuldidaktik>