Courses

# An Introduction to Evidence-Based Undergraduate STEM Teaching

*Cross-Network*

Details

## Description

"An Introduction to Evidence-Based Undergraduate STEM Teaching" is an open, online course/MOOC designed to provide future STEM faculty, graduate students and post-doctoral fellows with an introduction to effective teaching strategies and the research that supports them. Based on other offerings the MOOC Teaching Team is aware that the course is also frequently taken by university staff, faculty, and administrators. The goal of the eight-week course is to equip the next generation of STEM
faculty to be effective teachers, thus improving the learning experience for the thousands of students they will teach.

The course draws on the expertise of experienced STEM faculty, educational researchers, and staff from university teaching centers, many of them affiliated with the CIRTL. Topics include key learning principles such as the role of mental models in learning and the importance of practice and feedback; fundamental elements of course design, including the development of learning objectives and assessments of learning aligned with those objectives; and teaching strategies for fostering active learning and inclusive classroom environments. For more details, see the course syllabus.

## Learning Outcomes

### Associate: Evidence-Based Teaching

- Describe and recognize the value of realistic well-defined, achievable, measurable and student-centered learning goals.
- Describe several known high-impact, evidence-based effective instructional practices and materials and recognize their alignment with particular types of learning goals.

- Describe several assessment techniques and recognize their alignment with particular types of learning goals.

## Associate: Teaching-as-Research

- Describe how to access the literature and existing knowledge about teaching and learning issues, in a discipline or more broadly.
- Define and recognize the value of the Teaching-as-Research process, and how it can be used for ongoing enhancement of learning.
- Describe how the integration of Evidence-Based Teaching, Learning Communities and Learning-through-Diversity within Teaching-as-Research can be integrated to implement and advance effective teaching practices for diverse learners.

## Associate: Learning Community

- Describe and recognize the value of learning communities, and how they impact student learning.
- Describe several techniques for creating a LC within a learning environment, including strategies that promote positive interdependence between learners so as to accomplish learning goals.
- Describe several techniques and issues of establishing LCs comprising a diverse group of learners.

## Associate: Learning-through-Diversity

- Describe the scope of diversity in learning environments, of both students and instructor. (*Including but not limited to backgrounds, race, gender, ability, socio-economic status, ethnicity, gender preference, and cognitive skills)
- Describe the impact of diversity on student learning, in particular how diversity can enhance learning, and how inequities can negatively impact learning if not addressed.
- Describe and recognize the value of drawing on diversity in the development of teaching plans (including content, teaching practices and assessments) to foster learning.

## Practitioner: Learning Community

- Access the literature and existing knowledge to develop a deeper understanding of the knowledge

concerning LCs and their impact on student learning.

- Implement one or more LC strategies for students in a learning experience.

## Practitioner: Evidence-Based Teaching

- Integrate one or more evidence-based teaching strategies into a teaching plan so as to accomplish learning goals.