Course Description

This course introduces students to the discipline of engineering education research from a historical, methodological and content perspective. The interactive course is explicitly aimed at future engineering educators as well as future engineering education and engineering practice researchers. More specifically, the course will explore the context of the grand societal challenges and the corresponding changes of the nature of engineering work as the trigger for the paradigmatic transformation of systems that support the professional formation of engineers. In the context of this broader discourse, we will discuss the continuum from scholarly teaching, the scholarship of teaching and learning to educational and social research using current examples from the field. Based on this discussion, selected readings trace the emergence of the research discipline through scholarly articles capturing the discourse around research areas, accepted methodologies, and areas of inquiry.

Through targeted readings, discussions and analyses the students will develop a critical understanding of the development of the field as well as an appreciation of the methodological diversity employed in engineering education research. Topical readings of cutting edge research articles will provide a sound understanding of the various strands of inquiry and their implications for engineering education and practice. A semester-long project of framing an educational or practice research project in the context of engineering provides students with an opportunity to deepen their understanding of the theoretical concepts.

Credit hours

3 credit hours

Instructor

Dr. Joachim Walther
Faculty of Engineering
Office: 601E
Research Lounge: 211A
jwalther@uga.edu

Classroom Times/ Location

Time: Tuesday/Thursday 2:00 pm - 3:15 pm
Location: Driftmier Engineering Center (211A)

Course Objectives

Upon successful completion of the course, the student will be able to:

- Describe the distinctions and mutual relationships between the notions of scholarly teaching, the scholarship of teaching and learning and educational research in the context of engineering and identify the corresponding features of engineering practice research.
- Describe the context, strands of inquiry, and methodological approaches adopted in engineering education research.
- Critically analyze research from a range of methodological and epistemological traditions.
• Synthesize existing research approaches, areas of inquiry and existing research into a definition of a personal research or practitioner perspective.

Topic outline:
1. Introduction, shared goals and purpose of the course
   1.1. Scholarly engagement with teaching, learning, and practice in engineering: personal goals and expectations
   1.2. From engineering science research to educational and social research in engineering
       Example reading:

2. The context and history of the current discourse around engineering formation
   2.1. Historical developments in engineering education and practice
       Example reading:
   2.2. Grand challenges, visions for change and persistent issues for engineering education systems:
       Example readings:
   2.3. Paradigmatic transformations of engineering education:
       Example readings:

3. The discipline of engineering education research
   3.1. Emergence of engineering education as a research discipline
       Example reading:
   3.2. Scope and research agenda of the discipline
       Example reading:
   3.3. Methodological diversity of the field
Example reading:

3.4. Selected topics in the engineering education literature

4. Semester-long project: Application of educational research to inform teaching practice

4.1. Defining the need for an educational innovation

4.2. Developing innovative educational approaches grounded in the scholarship of teaching and learning

4.3. Framing a scholarly inquiry of an engineering education context (theoretical frameworks, research questions, methods)

Grading
This course is based on principles of active learning and is meant to engage students in exploring the material rather than presenting it in a passive way. As a consequence, overall success of the course depends on students' engagement with the material and their participation in the class discussions / activities.

A weighted average grade will be calculated as follows:
Participation ..............................................................................................30%
Reflective course journal ..........................................................................20%
Educational grant proposal .........................................................................20%
Written review and presentation of semester reading ................................20%
Student in-class presentations ....................................................................10%

The final class grades will be based on the following scale:

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