

# Workshop: Exploring the differences in engineering mechanics education

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***Abstract:** When speaking to colleagues involved in introductory engineering mechanics education, it is often apparent that the concepts students struggle with differ from one institution to another. During research conducted as part of an ALTC funded research project in engineering mechanics we have been able to quantify students' difficulties with some concepts and identify which difficulties are common across institutions and which ones aren't. In this workshop participants will work with selected examples and explore differences in the severity of students' troubles with mechanics and why it might differ. We will share what has worked for some educators and how academics would ideally like to teach certain mechanics concepts. Finally, we will use the idea of grade descriptors to generate discussion about how educators' expectations of students' proficiency in engineering mechanics concepts may vary, and discuss the implications for students, teaching and assessment.*

## **Outcomes for Participants**

- Exposure to good teaching practice in introductory engineering education, what works and what people would like to try.
- Discussion on how academics expectation of student learning may vary from institution to institution, and the importance of grade descriptors.
- Focussed networking for engineering mechanics educators.

## **Research Outcomes**

- Data on educators views on best practice for teaching mechanics, and academic standards set for students.
- Snapshot on the variety of approaches used to teach the same concepts, and their associated student learning outcomes.
- Insight into academics reactions to different teaching approaches, standards, and examples of successful educational practice.

**Workshop Plan (approx 1.5 hours)**

<b>Activity</b>	<b>Time</b>	<b>Who</b>
Introduction and research findings: Exam analysis, list of key areas of difficulty for students, variation between institutions.	15 min	Author 1 Author 2
Mechanics concept worksheet: Individuals complete a list of concepts, ratings of apparent significance, how concepts are taught successfully at their institution or how they could be.	10 mins	Participants
Worksheet discussion: Small groups share and compare ideas noted in their worksheets. Groups report back on the most interesting ideas or examples of educational practice.	25 mins	Participants
Exam paper comparison: Examples of how expectations of students proficiency in certain areas differs between institutions.	10 mins	Author 1
Grade descriptors: In groups, discuss and come to some agreement on a fair level of proficiency for first year students in a selected concept. Take note of disagreements or differing opinions. Report back interesting points.	15 mins	Participants
Sum up: Highlight the variance in academics approach to teaching, standards of proficiency, and severity of students' difficulties with key concepts. Offer commentary on how this variation, along with the variation in students abilities and interests will impact on the success of engineering mechanics education on the whole. Evaluation of the workshop, questions for the research, and close.	10 mins	Author 1 Author 2

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