

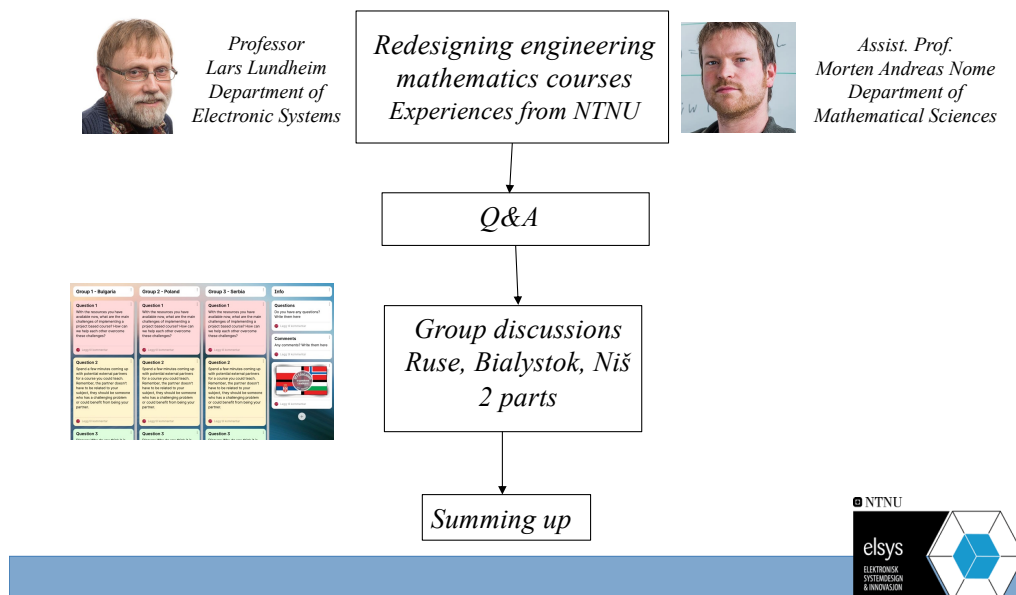


Redesigning Engineering Mathematics Courses

NTNUs 4th Workshop on Innovative Education, 28.10.2021

The document gives an overview of the workshop content with associated timeline in the video recording. Some useful links are found at the end. The workshop was organized by Department of Electronic Systems at Norwegian University of Science and Technology (NTNU) in the scope of Erasmus+ project Project ICT_EDUPAND nr 2020-1-PL01-KA226-HE-09.

Workshop overview



Timeline

00:00:00

Content (preseters)

Workshop overview

00:01:14

Redesigning Engineering Mathematics Courses (prof. Lars Lundheim)

- Mathematical courses for engineering students at NTNU
- Advantages, drawbacks and consequences of traditional courses
- The need for changed order and emphasis
 - Examples: differential equations, linear algebra
- Our project: Mathematics as a thinking tool
 - Collaboration between mathematics and eng. departments
 - Re-scheduling mathematical courses
 - Connecting the mathematical and engineering courses
 - contextuaization and its requirements
 - Thematically Integrating Motivational Examples (TIME)
- Assist. prof. Morten Andreas Nome writes in the chat:
“It is impossible to exaggerate the extent to which modern applied mathematics has been shaped and fueled by the general availability of fast computers with large memories. Their impact on mathematics, both applied



and pure, is comparable to the role of the telescopes in astronomy and microscopes in biology.”

- 00:29:24 Q&A
- Have you tried using practical engineering examples (e.g. from electrical circuits) in teaching mathematics?
- 00:30:45 **Introduction to Group work with Padlet (PhD fellow Pauline Hardeberg Zimmermann)**
Padlet link: <https://padlet.com/paulinehardeberg1/kv2msj64n5the1q1>
- 00:35:09 **Summary of group discussions (1st part: current situation)**
- 00:35:28 Poland (prof. Jaroslaw Makal)
 - 00:39:08 Serbia (prof. Goran Djordjević)
 - 00:45:57 Bulgaria (prof. Teodor Ilev)
- 00:46:04 **Introduction to group discussions (2nd part) (assoc. prof. Bojana Gajić)**
- 00:48:16 **Summary of group discussions (2nd part: possible improvements)**
- 00:48:55 Bulgaria (prof. Teodor Ilev)
 - 00:52:20 Poland (prof. Jaroslaw Makal)
 - 00:56:40 Serbia (prof. Goran Djordjević)
- 00:59:35 Q&A
- How did your teacher work 7-8 years ago?
 - If your students need some in-depth mathematical knowledge to perform their innovation project, can you ask the colleagues from mathematics department to give an additional lecture or are students supposed to learn it themselves?
- 01:07:33 Concluding the workshop series

Related links

Course descriptions

- Mathematics 1: www.ntnu.edu/studies/courses/TMA4101
- Mathematics 2: www.ntnu.edu/studies/courses/TMA4106
- Mathematic 3: www.ntnu.edu/studies/courses/TMA4111
- Mathematic 4: www.ntnu.no/studier/emner/TMA4121

TIME examples (in Norwegian)

- www.math.ntnu.no/emner/TMA4101/2021h/ovinger/ert-2-1.pdf
- www.math.ntnu.no/emner/TMA4101/2021h/ovinger/ert-3-2.pdf
- www.math.ntnu.no/emner/TMA4101/2021h/ovinger/ert-5-2.pdf
- www.math.ntnu.no/emner/TMA4101/2021h/ovinger/ert-13-2.pdf