Workshops on Innovative Education

Department of Electronic Systems

Norwegian University of Science and Technology (NTNU)

October 25-28, 2021

We will share our experience with changing the culture of higher education and implementing innovative education methods that have made our study programme one of the most attractive enginering programmes in Norway.

Workshop 1: Changing the culture of engineering education (Monday, 2-4 pm)

In this workshop we draw a big picture of our ongoing educational journey from traditional teaching to student-active learning based on modern learning theories, technology tools and teamwork.

We present different perspectives on the culture change that has evolved, and point out the main success factors.

The participants will have opportunity to discuss issues of interest with our team members, both professors, teaching assistants and students, and to reflect over their own teaching practice and possibilities for its improvement.

Main contributors: Assoc. Prof. Bojana Gajić, Prof. Lars Lundheim, Assist. Prof. Carl Richard Steen Fosse, PhD fellow Pauline Hardeberg Zimmermann, learning assistants Elias Orrem and Aria Alinejad

Workshop 2: Toolbox for innovative engineering education (Monday 4-6 pm)

In this workshop we present in more detail main methods and tools we have used in order to transform our teaching practice:

- Flipped classroom: video lectures and concept discussions with student response system
- Personal lab equipment opens new possibilities
- One-week design problems, technical reports and peer assesment
- Experience, reflection and training sessions in focus
- Gemification: an alternative approach to basic programming skills

The participants will have opportunity to discuss issues of interest with our team members, and reflect over possible use of presented methods and tools in their own teaching practice.

Main contributors: Assoc. Prof. Bojana Gajić, PhD fellow Pauline Hardeberg Zimmermann, Assist. Prof. Arne Midjo

Workshop 3: Early innovation project in engineering education (Wed 3:15-5 pm)

In this workshop we present practical details related to the planning, organization, and implementation of the innovation project that our students carry out during the 1st and 4th semester. The project is based on an actual need of an external partner. Each year we choose a new partner with a completely new problem.

The participants will have opportunity to discuss practical aspects of project-based learning with our team members, and reflect over the possible use of this approach in their own teaching practice.

Main contributors: Assist. Prof. Anders Strømberg, Assoc. Prof. Bjørn B. Larsen, Assoc. Prof. Milica Orlandić

Workshop 4: Redesigning engineering mathematics courses (Thursday 2-4 pm)

In this workshop we present our ongoing work with transformation of basic mathematical courses in engineering education in order to enhance their relevance and student motivation. We will present the TIME concept – Thematically Integrated Motivating Examples, and demonstrate the importance of shared responsibility for engineering mathematics courses design between mathematics and engineering departments.

We invite interested mathematics and engineering teachers to come together to this workshop in order to reflect over possibilities for improving engineering mathematics courses by working together.

Main contributors: Prof. Lars Lundheim (Department for Electronic Systems) and Assist. Prof. Morten Andreas Nome (Department of Mathematics)