Objectives:
The module gives an in-depth introduction to modelling of physical systems and the analogies between dynamics systems such as mechanical, electronic, and acoustic systems. Constructing and modelling physical systems requires an understanding of basic kinematics and kinetics. In turn, models of dynamic systems have analogies that can be described by the same underlying mathematics. Students who complete this module will understand how to simulate physics based sound and music systems such as musical instruments and everyday objects.

Students who complete the module will gain knowledge, skills and competences as follows:

Knowledge:
- Must have knowledge about the numerical methods for sound synthesis
- Must have knowledge about mass-spring systems, digital waveguides and other sound related synthesis methods.
- Must be able to understand the analogy between various dynamic systems, i.e. electronic, mechanical and acoustics systems
- Must be able to understand how to simulate the sound produce by a musical instrument or everyday object.

Skills:
- Must be able to apply knowledge to the creation of a physics based sound system.
- Must be able to understand how to calculate and model forces of dynamic systems
- Must be able to select and apply methods for modelling the analogy between various dynamic systems i.e. electronic, mechanical and acoustics.

Competencies:
- Must be able to understand how to collaborate within teams designing, building and modelling physical artefacts
- Must be able to synthesize methods for modelling of physical systems and analogies between various dynamic systems such as electronic and acoustics systems

Type of instruction:
Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Joint Programme Regulations and directions are decided and given by the Study Board for Media Technology.

Exam format:
In accordance with the current Joint Programme Regulations and directions on examination from the Study Board for Media Technology:
Individual oral or written examination with internal censor. The assessment is performed with the 7-point scale.

Evaluation criteria:
The criteria for the evaluation are specified in the Joint Programme Regulations.