AEA - School of Engineering and Automotive

# Master Engineering Systems (MES)

Volante Reunion – November 10th, 2022

Dr. Ir. Saskia Monsma

HAN_UNIVERSITY
OF APPLIED SCIENCES

# Master Engineering Systems

- Part of the School of Engineering and Automotive
- Video drone


https://www.youtube.com/watch?v=ikc5PIPi_lM

# Content

- Master Engineering Systems (MES)
  - Key points
  - Tracks
  - Modular structure and elective modules
  - Major Project
- Master Automotive Engineering (MAE) Double Degree
- Questions

# Technical master at HAN

- Master Engineering Systems with tracks
  - Automotive Systems
  - Control Systems
  - Sustainable Energy

- Master Automotive Engineering (MAE)
  - Double degree Master
    from 5 partner universities
    from HAN, CTU Prague,
    ENSTA Brest, TUCH Chemnitz, ITB Bandung

Master of Automotive Engineering

HAN_UNIVERSITY
OF APPLIED SCIENCES

# Han MES Key Points

- MSc Degree (90 EC)
- Professional Master
  - Strong practical focus (applied research)
  - For an engineering leadership role in business
  - Close cooperation with industry, institutes & research
  - Individual study choices: tracks with elective modules)
- International focus
- English
- Fulltime (1.5 yr) and part time (2.5 – 3 yr)

# Profile Engineering Systems

# MES – common modules

| Systems Modelling | | Applied Control | |
|---|---|---|---|
| Applied Physics | 2 EC | Feedback Control | 4 EC |
| Introduction Modelling | 2 EC | Multivariable systems and optimizations | 2 EC |
| Matlab Simulink | 2 EC | Controller Implementation | 2 EC |
| System Idenfication | 2 EC | Apply Controller Strategies | 2 EC |
| Energy based modelling | 2 EC | | |
| Minor Project | 5 EC | Minor Project | 5 EC |

# MES – Tracks and elective modules

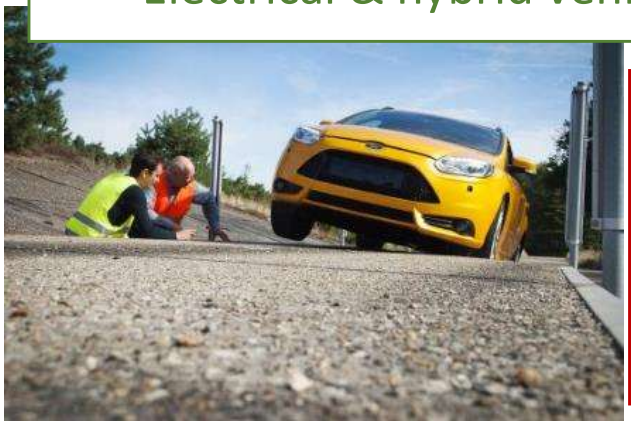
| | Modules | | | EC |
|---|---|---|---|---|
| **Common** | Systems Modelling | | | 15 EC |
| | Applied Control | | | 15 EC |
| **Tracks** | Automotive Systems | Control Systems | Sustainable Energy | |
| | Advanced Vehicle Dynamics<br><br>Innovations in Powertrains<br><br>Hydrogen Technology<br><br>Intelligent Mobility | Advanced Controller Design / Distributed Systems<br><br>Big Data & Small Data | Sustainable Energy Systems<br><br>Smart Power Supplies<br><br>Hydrogen Technology | 30 EC<br><br>(15 credits per module) |
| | Major Project | | | 30 EC |
| | * Extra curricular: Big Data & Small Data for Automotive Systems and Sustainable Energy, e.g., parallel with Major Project. Also possible: only theoretical part (lectures) | | | |

# Profile Track Automotive

Vehicle Dynamics
Advanced Driver Assist Systems (ADAS)
Collision warning & avoidance
Lane keeping assistant
Brake assist
Electronic stability control

➔ For cleaner, safer and smarter vehicles

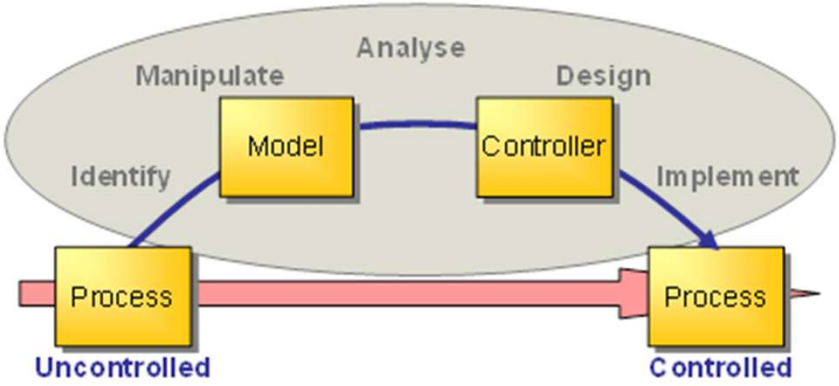
Fuel consumption
Emissions
Engines
Electrical & hybrid vehicles

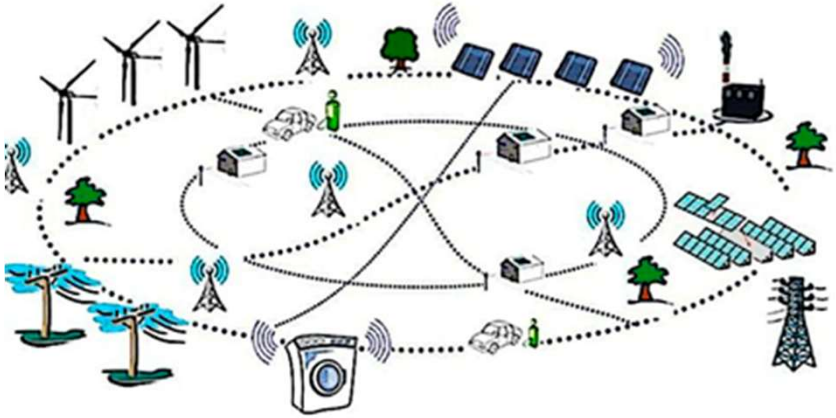


Advanced Driver Assist Systems
Intelligent mobility
Cooperative, connected and automated mobility (C-ITS)
Communication: V2V, V2I, V2X
Legal & business aspects

# Profile Track  Control Systems (1)

➔For a thorough understanding of the advanced regulating systems used in today's industry as well as cutting-edge techniques that are directly applicable in an industrial environment

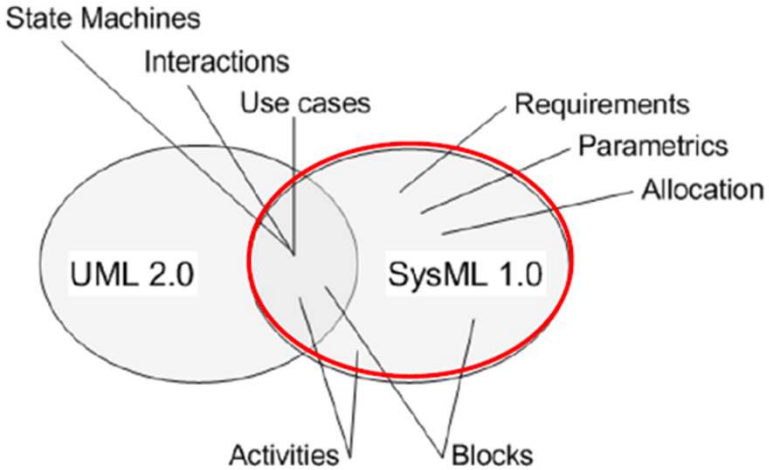


# Profile Track
# Control Systems (2)

➔ For smart distributed systems that are low cost, energy efficient and can solve complex tasks cooperatively.

➔ Model and validate complex non-linear systems with multiple inputs and outputs using UML and/or SysML.




# Profile Track
# Sustainable Energy Systems

➔ Sustainable and renewable energy systems for future energy requirements.

➔ Energy systems to work more efficiently on their own and in combination.

➔ Optimization of energy systems across multiple pathways and scales to increase reliability, reduce cost, and minimize environmental impact of our energy systems.


# Major Project

In this project you will

DEMONSTRATE YOUR MASTER LEVEL

By

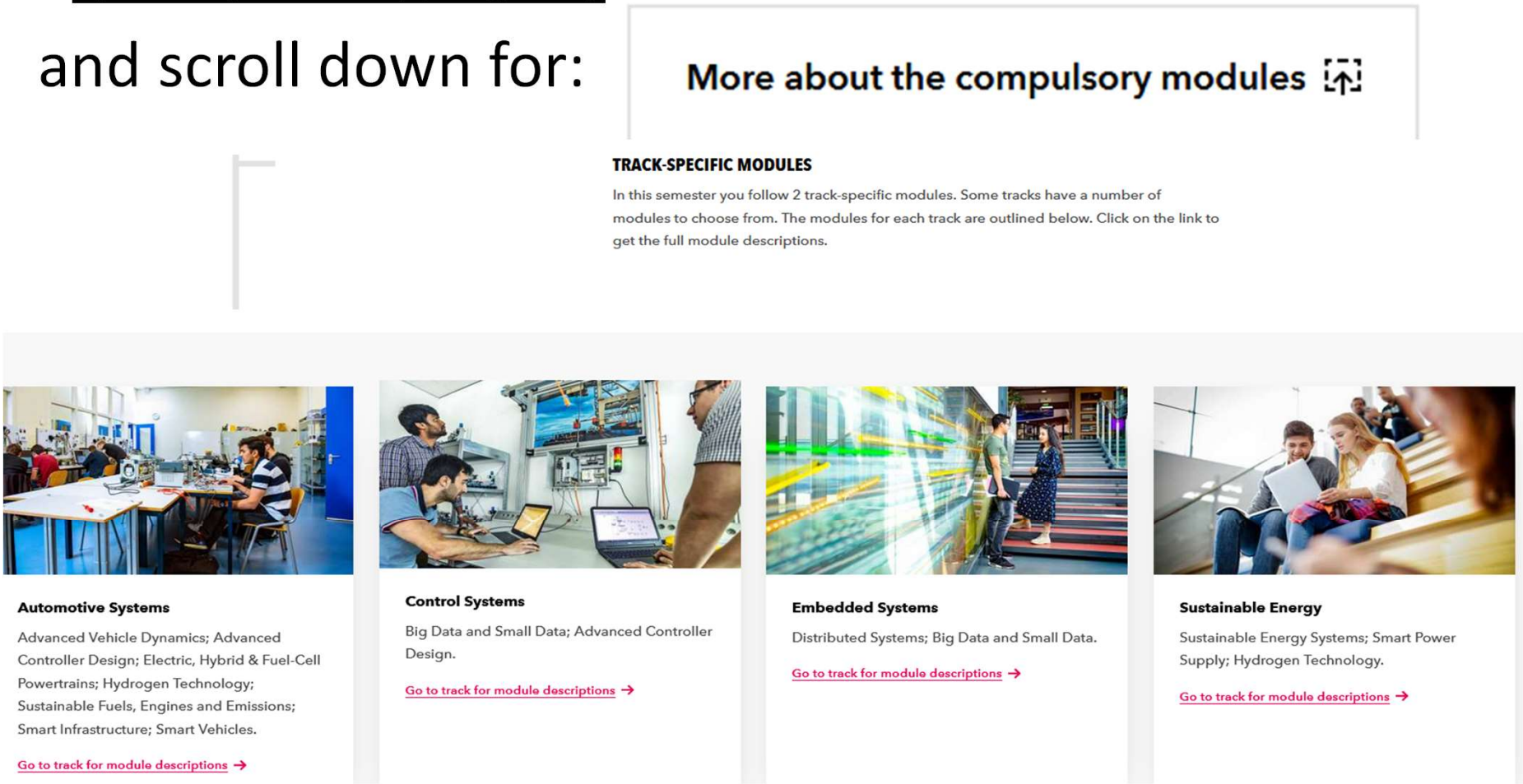
- Solving a practical technical problem for a client
- Developing and applying new knowledge
- Demonstrating the final qualifications on master level

# Module videos

For short intro videos and descriptions of the modules, see:

https://hanuniversity.com/en/programs/master/engineering-systems/fulltime/program/

and scroll down for:



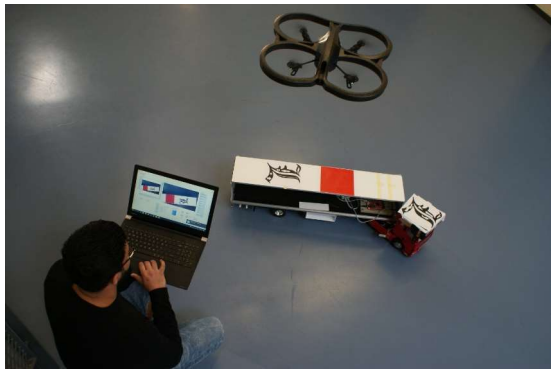
# Teaching Methods and Specialization

- Lectures, lab session, minor projects
- Practical and theoretical (research oriented)
- Interactive, flipped classroom
- International classroom
- Theory application in case studies
- Graduation assignment at a company, university or research institute

# MES and student engagement

Student engagement in the Master engineering Systems is very important: please take a look at the following example:

# Thank you for your attention and welcome!



Contact:

- Educationoffice.tm@han.nl
- +31 26 36 58 215

Info:

- https://www.hanuniversity.com/en/programs/master/engineering-systems/fulltime/
- https://www.hanuniversity.com/en/programs/master/engineering-systems/parttime/
- MAE double degree Master program: www.emae.eu

# Questions

# Professional Master Versus Academic Master

**Professional Master**

- At a University of Applied Sciences
- Focused on applying science in the professional field
- Prepares for job in professional field
- MSc.
- Use of scientific (research) methods, techniques and literature

**Academic Master**

- At a Research University
- Focused on scientific research
- Prepares for further study (PhD/DSc/Dr) or job in research
- MSc.
- Use of scientific (research) methods, techniques and literature