

## Tárgytematika / Course Description

### Hybrid Electric Vehicles

AJNM\_BMTA034

Tárgyfelelős neve /

Teacher's name: dr. Tóth-Nagy Csaba

Félév / Semester: 2021/22/1

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 2/2/0

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

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### OKTATÁS CÉLJA / AIM OF THE COURSE

The subject aims to equip future engineers with knowledge, skills and abilities that enable them to choose and size the main components of electric and hybrid electric vehicles working alone or in a team.

Furthermore, participants will understand the basic hybrid vehicle control strategies and they will be able to support the design process with computer simulation.

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### TANTÁRGY TARTALMA / DESCRIPTION

- Environmental issues, decreasing oil reserves, emission standards in Europe, USA, and Japan, challenge
- Energy converters, internal and external combustion engines, architecture and operating principles
- Hybrid-electric drive systems, architecture and operating principles. Series
- Hybrid-electric drive systems, architecture and operating principles. Parallel
- Hybrid-electric drive systems, architecture and working principles. Combination
- Hybrid-electric drive systems, architecture and working principles. Power split
- Fuel cells. Architecture and working principles
- Alternative fuels. F-T diesel, bio-diesel, ethanol, methanol, hydrogen
- Decreasing exhaust gas emissions and fuel consumption with alternative drive technology
- Testing principles of alternative vehicles, methodical differences, standards and recommended practices
- Modeling and simulation of alternative vehicles
- Backward looking and forward looking simulation models

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### SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

exam, semester project

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### KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

- Class notes, Iqbal Husain: Electric and Hybrid Vehicles (design fundamentals)

- Hybrid Drives, Fuel Cells and Alternative Fuels (The Bosch Jellow Jackets)
- Everything on the internet