

Tárgytematika / Course Description

Simulation of Internal Combustion Engines

AJNB_BMTA005**Tárgyfelelős neve /****Teacher's name:** dr. Hanula Barna**Félév / Semester:** 2021/22/2**Beszámolási forma /****Assesment:** Vizsga**Tárgy heti óraszám /****Teaching hours(week):** 2/2/0**Tárgy féléves óraszám /****Teaching hours(sem.):** 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

The aim of the course is to analyse the gas exchange processes of internal combustion engines using AVL Boost software. Students will learn about the theoretical foundations, and then investigate the effect of different designs on intake and exhaust systems on gas exchange using the mentioned software.

TANTÁRGY TARTALMA / DESCRIPTION

- 1. week: Course description, presentation of the requirements
- 2. week: Gas exchange process of the internal combustion engines, important motor parameters
- 3. week: Structure of the intake and exhaust systems, and its parametrical effects for the volumetric efficiency
- 4. week: Effect of selection of control parameters on gas exchange
- 5. week: Fundamentals of fluid dynamics, basics of flow modeling
- 6. week: Practise: Introduction of the AVL BOOST software, model building (online)
- 7. week: Practise, introduction of the assessment report (online)
- 8. week: Practise (online)
- 9. week: Practise (online)
- 10. week: Practise (online)
- 11. week: Practise (online)
- 12. week: Consultation (online)
- 13. week: Consultation (online)
- 14. week: Deadline for the assessment report

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

Students will receive a grade for the structure of the individual simulation model prepared during the semester and for the content and quality of the report describing the results of this model. The formal requirements for the report will be presented in the first lesson. The scoring system is as follows:

- 27 – 30 pont: excellent
- 24 – 26 pont: good
- 20 – 23 pont: satisfactory

- 16 – 19 pont: pass
 - 0 – 15 pont: fail
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KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

- 1) Michael Trzesniowski: Rennwagentechnik [Wiessbaden 2008]
- 2) Dezsényi György, Emőd István, Finichiu Liviu: Belsőégésű motorok tervezése és vizsgálata, [Nemzetközi Tankönyvkiadó Rt, Budapest 1999]
- 3) Pulkrabek, W., Volumetric Efficiency of SI Engines, Engineering Fundamentals Of The Internal Combustion Engine, Prentice Hall, New Jersey, USA, 1997, 168-173
- 4) Vass A. Belsőégésű motorok szerkezete és működése, Szaktudás Kiadó Ház, 2005, ISBN: 9789639553491
- 5) Basshuyen, R. V., Schafer, F., Internal Combustion Engine Handbook: Basics, Components, Systems and Perspectives, SAE International, 2004, ISBN: 0768011396
- 6) Köhler, E., Flierl, R., Verbrennungsmotoren – Motormechanik, Berechnung und Auslegung des Hubkolbenmotors, Vieweg+Teubner Verlag, 2011, ISBN: 978-3-8343-1486-9