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| Óbudai UniversityDonát Bánki Faculty of Mechanical and Safety Engineering | | | | | | Institute of Mechatronics and Vehicle Engineering | | | | |
| **Course name and Neptun-code: Modelling and Simulation BMXSTE3MNE Credits/ECTS: 3**Full time, 1st Semester of the Academic year 2019/20 | | | | | | | | | | |
| Faculties in which the subject is taught: **MSc in Mechatronics** | | | | | | | | | | |
| Supervised by: | Prof. Dr. Pokorádi László full professor | | | | | | Lecturer: | | Prof. Dr. Pokorádi László full professor | |
| Prerequisites conditions | | | |  | | | | | | |
| Lessons per week | | Theory: **2** | | | Classroom practice.: **-** | | | Labor: **1** | | Consultation: |
| Exam type (s,v,f): | | **Mid-term mark** | | | | | | | | |
| **A tananyag** | | | | | | | | | | |
| *Aim:* Development of engineering and problem-solving thinking, presentation of the tools of mathematical modeling required for engineering work, acquisition of basic modeling and systems analysis methods. | | | | | | | | | | |
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| **Schedule** | | | | | | | | | | |
| Week | | | Topics | | | | | | | |
|  | | | Theoretical Background | | | | | | | |
|  | | | Parameters & Signals | | | | | | | |
|  | | | Dimensions of Parameters & Dimensional Analysis | | | | | | | |
|  | | | Classification of Systems | | | | | | | |
|  | | | Classification of Models | | | | | | | |
|  | | | Linear Mathematical Modelling | | | | | | | |
|  | | | Non-Linear Mathematical Modelling | | | | | | | |
|  | | | Stochastic Mathematical Modeling | | | | | | | |
|  | | | Graphs & Networks | | | | | | | |
|  | | | Models’ Application | | | | | | | |
|  | | | Model Uncertainties | | | | | | | |
|  | | | Mathematical Model-based Simulations | | | | | | | |
|  | | | Monte-Carlo Simulation | | | | | | | |
|  | | | Retake | | | | | | | |
| **Literatures:** | | | | | | | | | | |
| 1. Pokorádi László – Szabolcsi Róbert: Mathematical Models Applied to Investigate Aircraft Systems. Budapest: Mûegyetemi Kiadó, 1999. 146 p. Monographical Booklets in Applied and Computer Mathematics; 12. ISBN:ISSN 1417 278 X. 2. ALBERT-LÁSZLÓ BARABÁSI: Network Science, <https://barabasi.com/book/network-science> 3. Applied Dimensional Analysis and Modeling, Kindle Edition 4. Andrei D. Polyanin, Alexander V. Manzhirov, HANDBOOK OF MATHEMATICS FOR ENGINEERS AND SCIENTISTS, Chapman & Hall/CRC, 5. Moodle electronic materials | | | | | | | | | | |