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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
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