

Syllabus

Computer Aided Engineering

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| <i>Mechanical Engineering and Robotics</i> | Field of study: | Mechatronics, Mechanical Engineering |
| | Specialisation: | All |
| | Level of study: | 1 st year (2 nd semester) |
| | System of education: | Bachelor degree |

Proszę wpisać propozycje semestru (semestrów) w których przedmiot powinien być realizowany.

| Course obligatory / optional | | | | ECTS points: | | | |
|------------------------------|--------------|----|---|--------------|-----|---------|-----------------|
| Semester | No. of hours | L | C | P | Lab | Seminar | Completion/Exam |
| <i>2nd</i> | | 30 | | | 15 | | C + E |
| <i>Proposal 2</i> | | | | | | | C |

| Course content (Lecture) | |
|--------------------------|---|
| Fall semester | <ol style="list-style-type: none"> 1. <i>Introduction to CAE. dependencies between CAD, CAM, CAT – 2h</i> 2. <i>Role and importance of CAE in operation of an enterprise. Special stress on Research & Development processes – 2h</i> 3. <i>Structure and examples of CAD, CAM systems. Interfaces and standards – 2h</i> 4. <i>Introduction of MATLAB, environment, basics of syntax – 2h</i> 5. <i>Preparation of MATLAB scripts and graphics – 2h</i> 6. <i>Introduction to toolboxes (Signal Processing Toolbox) – 2h</i> 7. <i>Introduction to SIMULINK. Preparation of simple models of mechanical systems – 2h</i> 8. <i>Introduction to Fast Prototyping. Presentation of used hardware and software – 2h</i> 9. <i>Industrial computers. Most popular standards and manufacturers – 2h</i> 10. <i>Real Time Operating Systems. Key features. Application in rapid prototyping – 2h</i> 11. <i>Computer assisted Mechatronic design – 4h</i> 12. <i>Introduction to AMESIM - The integrated platform for 1D multi-domain system simulation - 2h</i> 13. <i>Introduction to multibody simulation – MSC ADAMS – 2h</i> 14. <i>Introduction to multiphysics simulation – COMSOL – 2h</i> |
| Spring semester | |

| Course content (Classes) | |
|--------------------------|--|
| Fall semester | |
| Spring semester | |

| Course content (Project) | |
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| Fall semester | |
| Spring semester | |
| Course content (Laboratory) | |
| Fall semester | 1. <i>Modeling of mechatronic systems with MATLAB/ SIMULINK, problem definition, possible</i> |
| Spring semester | |

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| <i>approaches, model parameters – 4h</i> 2. <i>Modeling of several proposed mechanical systems – 4h</i> 3. <i>Modification of models, analysis of steady state and transient responses, linear analysis tools – 2h</i> 4. <i>Introduction to AMESIM – 2h</i> 5. <i>Modeling of electrohydraulic and pneumatic systems with AMESIM – 3h</i> |
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| Course content (Seminar) |
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| Fall semester |
| Spring semester |

| References (Basic): |
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| 1. AMESIM LMS 2. COMSOL Tutorial and user guide 3. MATLAB. MathWorks 4. SIMULINK. MathWorks |

| References (Additional): |
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| Expected learning outcome: | Knowledge of CAE advantages in product development. Good command of MATLAB/ SIMULINK environment. Ability to model mechanical systems |
| Language of instruction: | English |
| ERASMUS subject code: | |
| Prerequisites: | Mathematics, Physics |
| Assessment method: | Positive assessment of laboratory reports (2 reports) |
| Unit: | |
| Lecturer: | dr inż. Tomasz Barszcz |
| Lecturer (Project / Laboratory): | mgr inż. Adam Jabłoński |
| Modified: | |