

# ***Theory of Machines and Automatic Control***

**Winter 2017/2018**

*Field of studies: Electric and Hybrid Vehicle Engineering (full-time)*

**form of studies: 30 hrs lecture, 15 hrs project class**

**ECTS: 4**

**Lecture: Tuesdays at 8:15 (room 3.3)**

**Projects: Wednesdays at 9:15 (room 3.8)  
1st meeting on 8<sup>th</sup> November**

**Lecturer: Sebastian Korczak, PhD, Eng.**

room: 2.8b

e-mails: [sebastian.korczak@simr.pw.edu.pl](mailto:sebastian.korczak@simr.pw.edu.pl), [admin@myinventions.pl](mailto:admin@myinventions.pl)

consultations: Tuesdays at 10:00-11:00 and Thursdays at 12:00-13:00

website with materials and marks: <http://myinventions.pl/lectures/>

# Assessment method

Exam: written examination on skills and knowledge after completing and successful attestation of project classes.

2 terms in the winter examination session (1.02, 8.02)

1 term in the autumn examination session (3.09 – 19.09)

Negativ mark: 2,0

Positiv marks: 3,0; 3,5; 4,0; 4,5; 5,0

# EXAM – IMPORTANT NOTES

- You have to pass the project class to attend the exam.
- Student card or erasmus paper is needed on the exam.
- Please write the exam clearly on the A4 paper.
- Everyone must to return the exam.
- You can not use any electronic devices during the exam (mobile phones, smart watches, calculators).
- Table of Laplce transform will be displayed on the screen.
- Additional persons are delegated to help during the exam.
- Any cheating behaviors will cause exam failure.
- Topics will be distributed in printed form or displayed.

# EXAM – IMPORTANT NOTES

- Your answers will be rated with points.
- Exam mark will be based on the total number of points achieved with the rules:
  - ♦ < 50% - mark 2 (exam failed)
  - ♦ 51%-60% - mark 3,0
  - ♦ 61%-70% - mark 3,5
  - ♦ 71%-80% - mark 4,0
  - ♦ 81%-90% - mark 4,5
  - ♦ >90% - mark 5,0
- If marks from project class and exam are positive, then  
$$\text{Final\_mark} = 0.5 * \text{project\_mark} + 0.5 * \text{exam\_mark}$$

# EXAM – IMPORTANT NOTES

## MAIN GROUPS OF TOPICS

1. Mechanisms – kinematic pairs, movability, velocities and accelerations, dynamics.
2. Machine dynamics – system reduction, equation of machine motion, flywheel.
3. Laplace transform. Transfer function.
4. Clasification of basic automatic systems and their characteristics (step responses, Nyquist and Bode plots).
5. Block diagram algebra (information and sum nodes, serial, parallel and feedback connections).
6. Controllers (on/off, PID).
7. Stability criterions.

Please prepare carefully for the exam.

# EXAM – TERM 1

## 1st February 2018 (Thursday)

12:00 – 13:15 exam for lecture in polish

**13:25** – lecture hall (room 3.4) opening

13:25-13:30 – preparation

13:30-14:30 – exam

## 5th February 2018 (Monday)

to 12:00 – publication of exam effects on the website

<http://myinventions.pl/lectures/> and USOSweb

12:00-14:00 – filling of indexes and erasmus papers

# EXAM – TERM 2

## 8th February 2018 (Thursday)

12:00 – 13:15 exam for lecture in polish

**13:25** – lecture hall (room 3.4) opening

13:25-13:30 – preparation

13:30-14:30 – exam

## 11th February 2017 (Sunday) – last session day

to 23:59 – publication of exam effects on the website

<http://myinventions.pl/lectures/> and USOSweb

## 13th February 2017 (Monday)

12:00 – 14:00 – filling of indexes and erasmus papers