Course Title: COMPUTER CONTROLLED SYSTEMS

<table>
<thead>
<tr>
<th>Semester*</th>
<th>Code</th>
<th>Program**</th>
<th>No of hours per week: lectures + exercises</th>
<th>Total</th>
<th>ECTS credits</th>
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<tbody>
<tr>
<td>6 or 8</td>
<td>18721</td>
<td>ME</td>
<td>2 + 1</td>
<td>30+15</td>
<td>4</td>
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Lecturer:

Course objective:
The aim of this course is to extend learners’ knowledge and understanding of classic and modern control theory and its applicability to the control of servomechanisms and industrial processes. Special focus will be given to fluid power control systems - proportional and servo hydraulics/pneumatics, electrical drives, as well as sensors and signal processing. The unit will also deal with the representation of multivariable dynamic systems, modern methods in automatic control and implementation of control algorithm in time discrete domain. Learners should also use modelling and simulation tools (Matlab and Simulink) to the analysis and synthesis of feedback control systems and components for real-time control.

Prerequisite: Basic Principles of Automatic Control

Learning outcomes:
After completion of the course students will be able to:
- Model and analyse multivariable dynamic systems.
- Apply some advanced control techniques in automatic control.
- Design fluid power systems (proportional and servo hydraulic/pneumatic control systems).
- Give a comparison between fluid power controlled systems with electrical servo drives.
- Use modelling and simulation software tools to the analysis and synthesis of feedback control systems.
- Understand the technical requirements for real-time control applications.

Course contents

Lecture/Topic:
5. *Applying the control theory to fluid power systems*. Mathematical models of hydraulic and pneumatic servo systems. Position, velocity and force control of fluid power systems.
7. *Control of electrical drives*. Comparison of electric drives with hydraulic and pneumatic servo drives.
10. *Real-time control systems applications*: Industrial automation solutions using programmable logic controller (PLC) and programmable automation controller (PAC).

Recommended literature:

Type of exercises:  x auditory;  x laboratory;  ☐ practicum;  ☐ design;  ☐ other

Examination:  x final exam;  ☐ continuous testing;  ☐ other

Language:  x English, Croatian

Tutorials in English for incoming students: YES

* Bachelor program: Semester 1-7, Master program: Semester 8-10
** ME – Mechanical Engineering, NA – Naval Architecture, AE – Aeronautical Engineering