## Optimal control

Faulwasser Timm

<table>
<thead>
<tr>
<th>Cursus</th>
<th>Sem.</th>
<th>Type</th>
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<tr>
<td>Génie électrique</td>
<td>Obl.</td>
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<td>Manufacturing</td>
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**Frequency**
Every 2 years

**Remarque**
Every 2 years. Next time: Spring 2018

### Summary

#### Content
The course will cover the following topics:

**NLPs and Optimal Control**
- Brief review on static optimization
- Pontryagin's maximum principle and necessary conditions of optimality (NCO)
- Turnpike and dissipativity properties in Optimal Control

**Solution methods**
- Analytical solution approach (type and sequence of arcs in optimal solutions)
- Indirect and direct solution techniques
- Direct sequential and simultaneous solution techniques

**From optimal to sampled-data predictive control**
- Stability and convergence properties
- Economic MPC approaches
- Case studies from mechatronics, process systems and climate economics

### Assessment methods
Project Report.