The course aims at:
· Being aware of the issues involved in the implementation of computer control systems.
· Providing basic knowledge on computer multitask programming technology
· Getting to know realtime operating systems
· Introducing to the practical implementation of control and supervisory applications
### Study load

<table>
<thead>
<tr>
<th></th>
<th>Hours large group:</th>
<th>Hours medium group:</th>
<th>Hours small group:</th>
<th>Guided activities:</th>
<th>Self study:</th>
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<tbody>
<tr>
<td><strong>Total learning time</strong></td>
<td>150h</td>
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<tr>
<td></td>
<td>30h</td>
<td>0h</td>
<td>30h</td>
<td>0h</td>
<td>90h</td>
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<td></td>
<td>20.00%</td>
<td>0.00%</td>
<td>20.00%</td>
<td>0.00%</td>
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# Content

## 1. Introduction to realtime systems

**Learning time:** 8h  
Theory classes: 3h  
Laboratory classes: 0h  
Self study: 5h

**Description:**  
- Course goals  
- Definitions and goals  
- Characteristics of a realtime system

## 2. Time management

**Learning time:** 17h  
Theory classes: 3h  
Laboratory classes: 4h  
Self study: 10h

**Description:**  
- Definitions and concepts  
- Time management services SOTR  
- Periodic code execution

## 3. Task management

**Learning time:** 23h 30m  
Theory classes: 3h 30m  
Laboratory classes: 10h  
Self study: 10h

**Description:**  
- Invocation and scheduling mechanisms  
- Task states  
- QNX multitask programming
## 4. Task interaction

**Learning time:** 80h 30m  
Theory classes: 16h 30m  
Laboratory classes: 14h  
Self study: 50h

**Description:**  
- Introduction  
- Shared resources access  
- Message passing  
- Task synchronization  
- Shared resources access protocols

## 5. Peripheral device management

**Learning time:** 14h 30m  
Theory classes: 2h 30m  
Laboratory classes: 2h  
Self study: 10h

**Description:**  
- Peripheral devices  
- Register programming  
- Peripheral device interaction

## 6. Realtime operating systems

**Learning time:** 6h 30m  
Theory classes: 1h 30m  
Self study: 5h

**Description:**  
- What's an operating system?  
- What's a realtime operating system?  
- RTOS example: QNX
### Planning of activities

<table>
<thead>
<tr>
<th>LECTURES</th>
<th>Hours: 22h</th>
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<tbody>
<tr>
<td></td>
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<table>
<thead>
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<th>LABORATORY SESSIONS</th>
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<table>
<thead>
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<th>EXERCICES</th>
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<thead>
<tr>
<th>EXAMS</th>
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<th>SELF STUDY</th>
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### Qualification system

Written exams 50% (20% mid-term exam, 30% second-term exam)
Laboratory 50%
Other deliveries (optional problem solving): 10% global score improvement

### Bibliography

**Basic:**


**Complementary:**
