High Performance Embedded Systems (ENGT8315)

Lecturer:  A/Prof Thomas Bräunl
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Email:  tb@ee.uwa.edu.au

Semester 1, 6 points

Outcomes:
Students gain an understanding of the design and development of advanced embedded systems as used in mobile telecommunications systems, intelligent transportation systems, flexible manufacturing and automation systems, and related application areas; perform problem identification, formulation and solution in the context of a systems-based approach; and gain in-depth technical competence in the area of advanced computer systems engineering for high-performance and real-time embedded systems.

Content:
The topics covered in this unit are requirements analysis for high-performance embedded systems, system design for high-performance embedded systems, hardware design of high-performance embedded systems (single-board solutions, system-on-chip solutions), software design for high-performance embedded systems, testing and debugging of high-performance embedded systems (life cycle issues, risk-based test strategies, quality assessment), simulation and prototyping; real-time embedded systems: specification of real-time embedded systems (RT-UML, timed Petri nets, real-time logic), design of real-time embedded systems (RT-patterns, generalised RT-scheduling theory), performance modelling (discrete-event and hybrid control approaches), implementation, benchmarking and testing of real-time embedded systems; applications for high-performance embedded systems: intelligent and knowledge-based systems, mobile systems, telecommunication systems.

Assessment
In-depth technical competence in the subject matter is assessed by examination and assignment. Teamwork is assessed in a group laboratory report and demonstration of a developed and tested system.

Contact Hours:

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<tr>
<th>Type</th>
<th>Hours</th>
<th>Start</th>
<th>Note</th>
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<tbody>
<tr>
<td>Lectures</td>
<td>36 hrs comb.</td>
<td>week 1</td>
<td>combined block of combined block of</td>
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<tr>
<td>Labs</td>
<td></td>
<td>week 2</td>
<td>3h weekly</td>
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For days, time and venues, see:  [www.timetable.uwa.edu.au](http://www.timetable.uwa.edu.au)
Unit Co-ordinator:  [Associate Professor Thomas Bräunl](mailto:tb@ee.uwa.edu.au)
Tutors / Lab Supervisors:  Adrian Boeing, James Ng
Textbooks:  none

Course Notes:  [see link](http://www.timetable.uwa.edu.au)
Lab Assignments:  [see link](http://www.timetable.uwa.edu.au)
Supplem. Material:  [see link](http://www.timetable.uwa.edu.au)
Marks (Cont. Asses.):  [see link](http://www.timetable.uwa.edu.au)

Unit Structure
Introduction
C and C++ Programming (4 weeks)
Hardware Platforms and Device Drivers (4 weeks)
Real-time Image Processing (4 weeks)
### Assessment:

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<thead>
<tr>
<th>Type</th>
<th>% of final mark</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Labs 1-5</td>
<td>50%</td>
<td>10% per lab</td>
</tr>
<tr>
<td>C++ Test</td>
<td>20%</td>
<td>In-class test</td>
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<tr>
<td>Seminar Report</td>
<td>20%</td>
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<tr>
<td>Seminar presentation</td>
<td>10%</td>
<td>To be completed by end of Semester</td>
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<td>No final examination</td>
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**Penalties**
Each lab is due at the end of the scheduled session. Assignments and labs will receive a 20% penalty for each day late.

**Plagiarism**
All work submitted must be the student's (or group's, resp.) own work. Citations must be clearly marked as such. See the faculty policy on plagiarism.

**Scaling**
See the faculty policy for scaling marks.

**Appeals**
See the faculty policy for appeals.