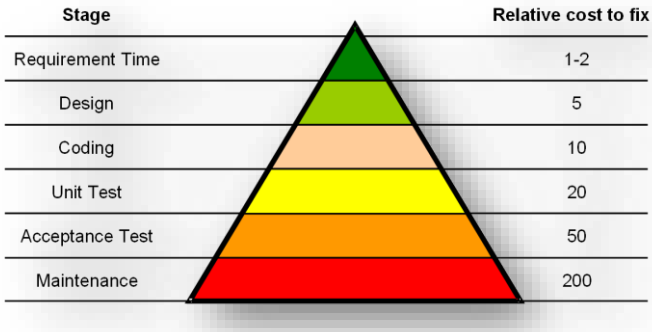
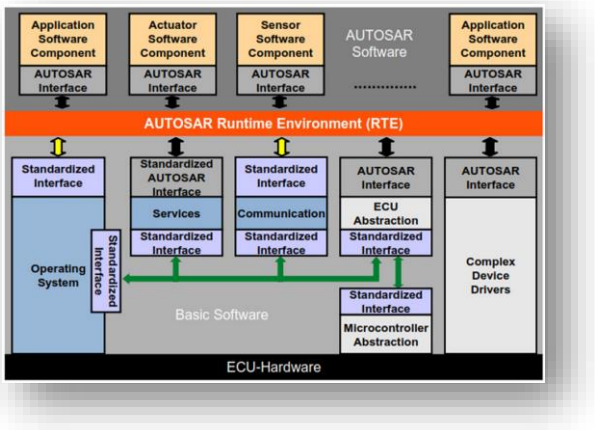
ELEC-E8408 Embedded Systems Development





GENERAL INFO 5 ECTS. Requirements engineering methodologies, software design approaches, metrics in software engineering, design for fault tolerance, software testing, envisioning the future of embedded systems.

PREREQUISITES ELEC-E8001 Embedded Real-Time Systems.

LEARNING GOALS On successful completion of this course, the student will be able to

1. Present sequential and agile life-cycle models for developing embedded systems
2. Apply a variety of requirements engineering methodologies for specifying embedded systems
3. Apply commonly used design specification techniques for embedded systems
4. Describe a core set of metrics in software engineering
5. Apply common techniques for designing fault-tolerant embedded systems
6. Select and tailor appropriate testing schemes for embedded systems
7. Justify and criticize technology forecasts on the future of real-time systems

TEXTBOOK P. A. Laplante and S. J. Ovaska, *Real-Time Systems Design and Analysis: Tools for the Practitioner*, 4th Edition. Hoboken, NJ: Wiley, 2012, Chapters 5, 6, 8, and 9.
http://onlinelibrary.wiley.com/book/10.1002/9781118136607
(E-book available for downloading only within the Aalto and Eduroam networks)

Lecture slides and other handouts to be available in MyCourses.

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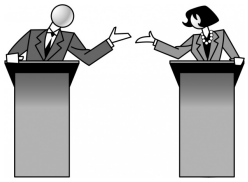
GRADING

Regular attendance to lecture (3h/week) and exercise sessions (1h/week) is strongly recommended. Illustrative case examples will be presented during lectures.

The final grade is a function of homework assignments **15%**, a mini project **15%**, and the final exam **70%**. It is not compulsory to complete the homework assignments. However, everyone must turn in a satisfactory mini project report.

Every week, homework assignments are given to students. The students solve those problems independently and turn in their solutions by the given deadline. Detailed instructions will be available in MyCourses during the first course week.

In the exercise sessions, the instructor will present model solutions to the assignments. In addition, other course-related topics will be discussed. The model solutions will be available in MyCourses well before the exam.



At the end of the course, we are going to have a few one-to-one debates on specific topics. Participation to these debates is *voluntary*, but those students who participate will get maximum points for their weakest homework assignment. The debates are exercises designed to allow students to strengthen their skills in the areas of leadership, interpersonal influence, problem solving, and oral presentation.

It is expected that students will complete the exam of this course successfully during the year 2019 (the last exam on September 2019). All the credits (or "points" in the following table) earned from the homework assignments and mini project are valid only until that last exam.

The final grade is determined according to the following table:

0 = below 50% of all possible points
1 = at least 50% of all possible points
2 = at least 60% of all possible points
3 = at least 70% of all possible points
4 = at least 80% of all possible points
5 = at least 90% of all possible points

TIME AND PLACE

Teaching periods III and IV in 2019 (7 + 4 = 11 weeks; lecture break on week 9).

Weekly 3 lecture hours and 1 hour of exercises. **Monday 10:15–12:00** (2h lectures); seminar room TU5. **Friday 10:15–12:00** (1h lectures + 1h exercises); seminar room TU6. First lecture on **January 7** and last on March 29.

On January 11, there are not yet any homework assignments, but we will discuss general practices related to homework assignments and exercise sessions.