Course Analysis

MF2103 Embedded Systems for Mechatronics
Spring 2022

Date and author: 2022-06-07 by Jad El-khoury

1   Course information

Course responsible teacher:

Jad El-khoury

Other teachers in the course:

Martin Törngren

Examiner:

Martin Törngren

Learning activities:

After passing the course, the students should be able to:

1.   Give example of embedded systems and their applications and describe the special requirements that are set to develop such systems.
2.   Be able to use modern integrated development environments for micro-controller/processor programming and their functionality for testing and troubleshooting.
3.   Explain the structure of control circuits and built-in processors
4.   Develop micro-controller programs for mechatronic applications including the use of I/O and external units.
5.   Apply knowledge in programming, and to a lesser extent in digital technology and automatic control, in the design and realization of control software on distributed embedded systems.
6.   Describe, explain and use software platforms, specific real-time operating systems (RTOS) and and network protocols

2   Students' view of the course

Students feedback was obtained via a survey done at the end of the course.

The students feel the overall workload to be reasonable, although it is very intensive to have the content squeezed into one period. It was for example suggested that maybe spreading the content over two periods gives the students more time to absorb the content.

The students were generally positive to the teaching format of having pre-recorded lectures, complemented by Seminars where they get the opportunity to ask specific questions, and discuss in

groups. Of course, this format did not suite all students. Some students also suggested having real physical meetings for the Seminars and group work.

Students also requested more sample exams. This was not so possible given that this course is relatively new (in its current format).

Many students found a particular module (DS) challenging to learn. This is due to the nature of the content, as well as the fact that only one week was provided for the module.

3 Teacher analysis of the course

Changes of the course before this course offering:

1. The Project content was improved based on experiences from the previous year. Two additional lectures were provided to introduce and support the project work.

2. Based on feedback from students, each Reading Assignment (and corresponding Seminar) is introduced through a short lecture that ought to help the students understand how to prepare for the work.

3. One of the literatures was changed to an old version of the same book after judging that its content was more appropriate for the course.

The course's strengths (based on the students' experiences and the teacher analysis):

The course introduced a flipped-classroom approach to learn the theory, where the students are asked to read the literature before attending a Seminar where the literature can be discussed in groups.

The theory is complemented with a project where the students implement what they learn.

Areas for improvement of the course (based on student experiences and teacher analysis)**:**

Too much content needs to be covered in this 9-credits 1-period course. More time needs to be given for the students to absorb and deeply learn the expected content.

The course covers three very related and relevant topics, but we need to find a good and fair balance on what to cover from each of the topics.

Proposed changes to the next course round:

After analysing the students' feedback, a meeting with the teaching staff was made to analyse both the students and the teaching staff experiences. Several practical detailed improvements were identified to be implemented for the next course round.

The biggest change is however to investigate the possibility to distribute the course content into two Periods.