Course Evaluation and Analysis.

MF2042 Embedded Systems for Mechatronics, I 6.0 credits

2011 ‑ 11 ‑ 29, 2011-12-12 and 2012-01-02
Evaluation performed by: Mats Hanson

Course facts:

Course homepage: http://www.kth.se/student/kurser/kurs/MF2042?l=en_UK
Credits 6.0 Hp
Number of students: 44
Pass rate three weeks after finale exam: 38 students completed all their labs. For the final exam, 1 student failed & 1 student did not do the exam, while all other students passed.
Teachers: Jad El-khoury, Martin Edin Grimheden, Fredrik Asplund, Magnus Persson, Virinchi Joglekar (lab assistant), Martin Lindstedt (lab assistant)
Examiner: Martin Edin Grimheden

Method.
1. A questionnaire was distributed to the students on the last lecture and the last lab. 20 were filled in. The result is enclosed.
2. Interview with four students 2011-12-14 at 9-10. The student's point of views is integrated as comments to the Questions below.
3. Interview with four teachers 2011-12-16 at 13-14.
   The teacher's point of views is integrated as comments to the Questions below.

Suggestions.

1. Keep the lab oriented pedagogy. Many labs were appreciated.
2. Better coordination between the Mechatronic Introduction course, P1, in terms of introduction to microcontrollers, broad view.
3. Better coordination between Robust course in terms of practical lab stuff.
4. Take a close look on how to improve the Programming is a Craft module.
5. Better coordination between teachers involved. More like a team then individuals that teach one module each. Perhaps it was too many teachers involved in the course.
6. The course material could be little more "harmonized"
7. Lab access - This type of course needs 24/7 access to the lab the whole semester.

Questionnaire

Question 1 Time spent on the course

The course has been running during six weeks. Try to estimate how much time you have spent studying for the course, in average per week. This includes all lectures, labs and homework

<u>Mean value</u>: 18 hours a week.
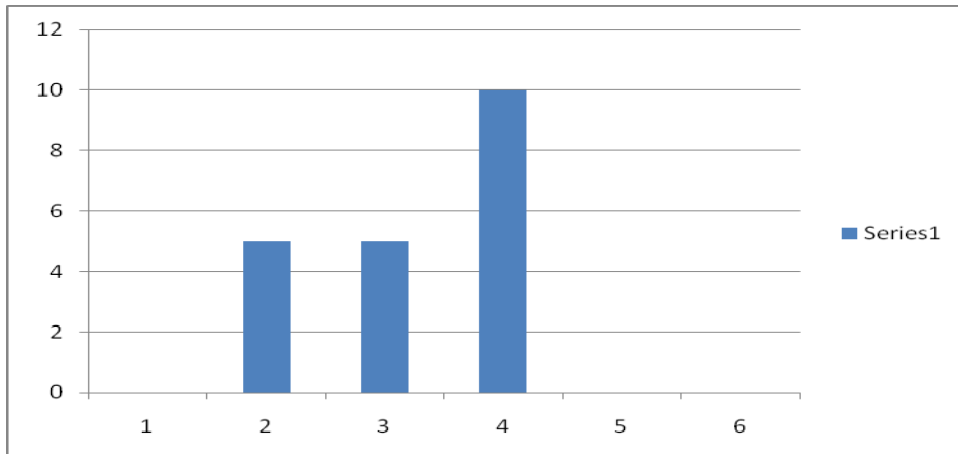
2 is 10-15 hours; 3 is 15-20 hours and 4 is 20-25 hours a week

Comment: 18 to 20 hours is approx 50% of full time and that's little more than the credit 6 hp gives.

Student comments:

1. Not all the hours in the evenings and weekends are included in the diagram. Extra time in the with lab with simple errors did not recognize as "hours"

2. The balance in the between the labs vary a lot.

3. It's a good balance with other courses in parallel like Robust.

Teacher's comments:

1. No direct coordination with robust course. Could benefit the coordination with simple lab problems.

2. Long Fridays.

Question 2 Relevance

The course was divided into 6 themes. Give us an indication as to how relevant you found each theme for your education.
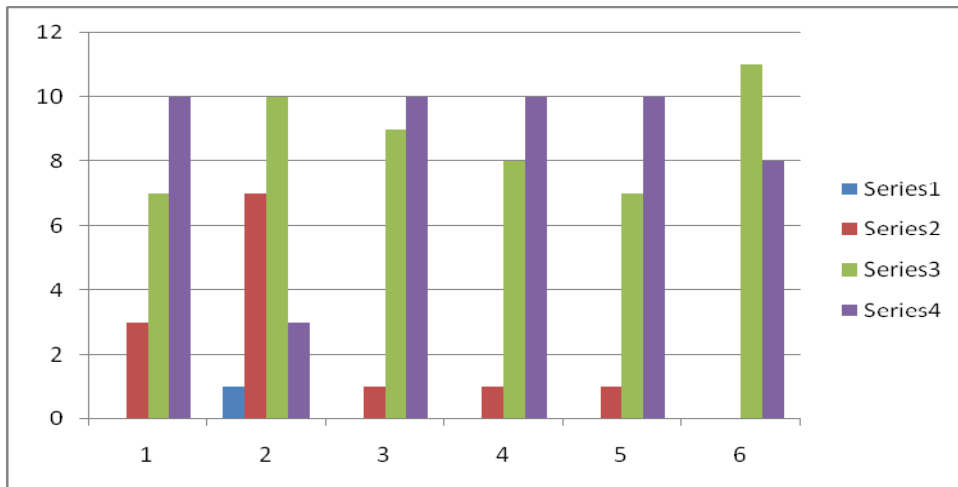
Series 1= Not relevant Series 2= Somewhat relevant Series 3 = Relevant Series 4 = Very Relevant

1: Introduction to AVR32
2: Programming is a Craft
3: CAN
4: Power Management
5: Distributed Systems
6: Model Based Development

Comment:

Theme 2 Programming is a Craft seems to be least relevant from the student viewpoint

Theme 3, 4, 5 and 6 seems to be very relevant.

Student comments: Theme 2 was not understood. Too many examples (42) on short time. Group discussion was not appreacheated.

Teacher's comments: Theme 2 could be hard to grasp at this point. Can be seen as more relevant later in the education. Idea is to make a follow up in the Advance course.

Question 3 Expectations

Give us an indication as to how the content of each theme met your initial learning Expectations
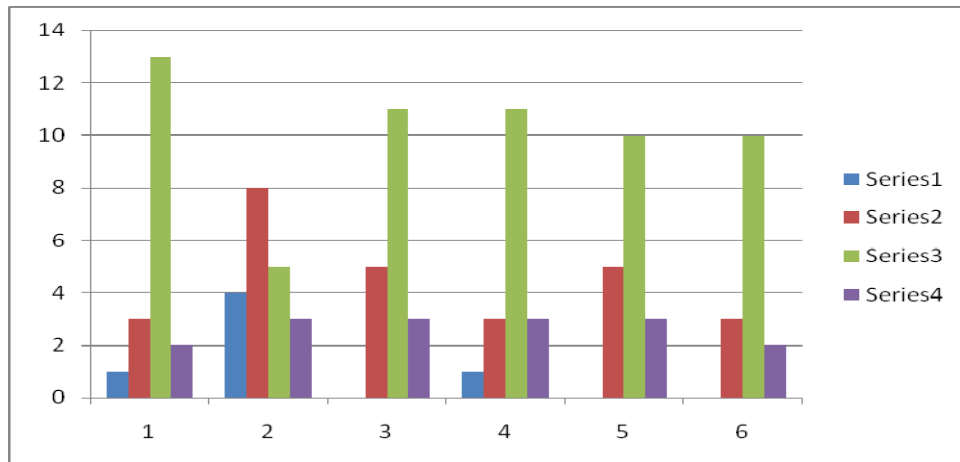
Series 1= POOR Series 2= FAIR Series 3 = GOOD Series 4 = EXCELLENT

1: Introduction to AVR32
2: Programming is a Craft
3: CAN
4: Power Management
5: Distributed Systems
6: Model Based Development

Comment:

Programming is a Craft did not meet the expectations. The rest was good or excellent

See comments on question 2.

Question 4 Suggestions

Give us any suggestions on how each theme can be improved in the future.

4.1 Introduction to AVR32

Other kinds of embedded systems should be introduced
Maybe more in depth tutorials
More general introduction to different controllers. To much focus on AVR32

4.2 Programming is a Craft

Make the lab better
First lab with general bugs, then specific ones
Improve lab 2 – was too rushed
Lab 1 and 2 should change places
Skip the discussion
Discussions takes time but we did not teach much, this should be moved to C/C++ course
Discussion was very good
Presentation was unnecessary
Better explanations at the beginning

Student comments: Hard to fit in the course.

Student comments: Lab 1 and 2 should change places – means that we should start with short examples before a lager program.

Student comments: Student discussion and feed-back takes a lot of time.

Teacher's comments: The idea of "Programming is a Craft" is important. Think about how to improve the pedagogy.

4.3 CAN

Better division of groups

4.4 Power Management

Slower explanations not only in two lectures
Maybe too long lab
Its good the use of special teachers

4.5 Distributed Systems

Too much about coding, things unrelated to distributed systems lab

4.6 Model Based Development

Not so fast explanations – many answers
Too much contents in short time

Question 5 Self-Assessment

These questions ask how well you achieved the learning goals of this course. Next to each objective listed, circle the number that best describes your accomplishment of that objective.
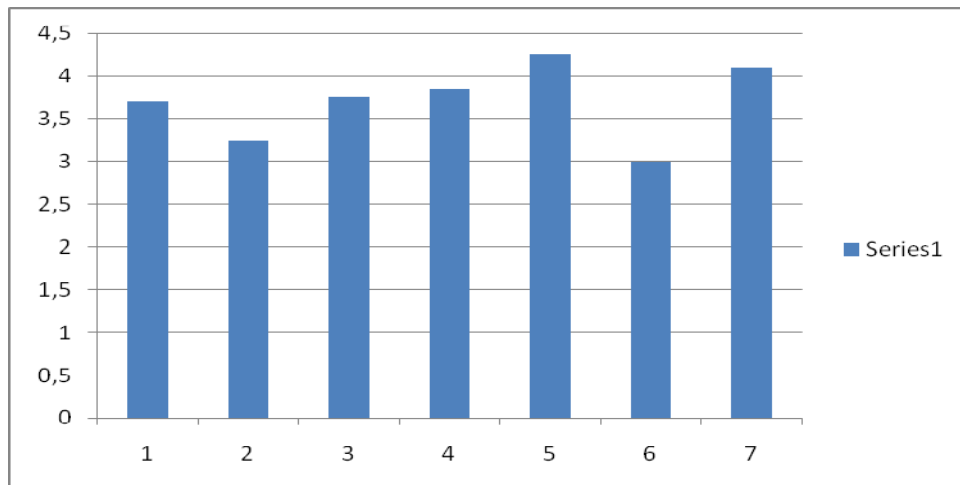
Series 1= Averages of rating from 1-5

1: Provide examples of existing embedded systems based products and describe the
Special requirements placed in developing such systems
2: Describe and explain important steps in the design of embedded systems…
3: Be able to use modern integrated development environments for microcontroller
Programming and debugging…
4: Describe and explain basic operation of microcontrollers…
5: Be able to develop basic microcontroller programs for mechatronic applications…
6: Describe, explain and apply basic concepts of concurrent and real   time
Programming.
7: Describe, explain and apply some of the basic concepts of communication
Protocols, in particular with reference to the CAN network…

**Comment:**

All are above 3,5 except #2 Describe and explain important steps in the design of embedded systems… and #6 Describe, explain and apply basic concepts of concurrent and real-time Programming.

Student comments: #6 low score because concurrent programming was not included in the course. (Coming in ES2)

Question 6 Course Evaluation

These questions ask about the course itself and its content. For each statement below, circle the extent to which you disagree or agree with each statement.
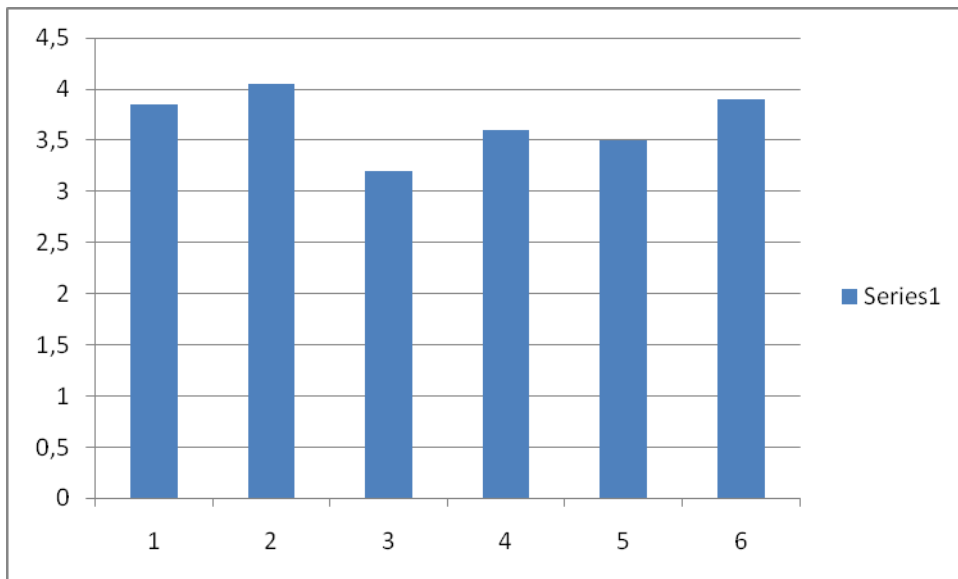
Series 1= Averages of rating from 1-5

1: The course content corresponded well to the course's stated learning goals
2: The course materials and handouts helped me achieve the course's learning goals
3: The way the course was organized facilitated my achieving its learning goals
4: The course content was applicable to my own goals for taking the course
5: The course was scheduled at day(s) and time(s) that fit well for my other commitments
6: The course was intellectually challenging

Comment:

Low score #3 The way the course was organized facilitated my achieving its learning goals

Student comments: Low score on #3 is correct because some problems with scheduling labs etc.

Question 7

What did you appreciate the most with the course?

- Good labs
- Hands on teaching and how to program embedded systems
- Good organization of the course
- A good knowledge and understanding
- Labs covering every studied subject
- Clear lab instructions
- All extra lab-support hours
- Very hands on!
- I really like the labs – to apply in practice what was learned in the lectures
- Great variarity of teachers
- Having a lot of practical experience
- Directions from teaching staff towards students with different backgrounds, they helped us with specific things
- A chance for evaluation is greatly appreciated

Student comments: seems to be correct

Question 8

What did you appreciate the least with the course?

- Very messy handouts – each one of them is quite OK but no consistency
- Too few lab slots
- Labs too long
- The PIAC lab had bit strange parts and the mandatory group presentations wasn't rewarding
- Frustrated to get stuckted on a simple error for a long time
- Demo to lab assistance is not a good idea
- The Fridays – too long days
- Reaching through the lectures sometimes
- Lab ass was not always satisfactory
- Lab schedule was not clear
- Lot of extra time was spend on some of the labs
- De sista labbarna tog för lång tid. Irriterande att det inte går att planera in med andra kurser. Man har inte tid att sitta 24/7.

Student comments: seems to be correct

Student comments: Some students did not have 24/7 access to the lab the whole period.

Teacher's comments: Some concern about the lab access roles. Not clear instructions. This type of course needs 24/7 access to the lab the whole semester.

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