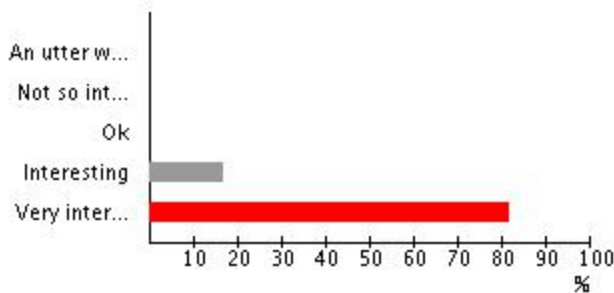


Survey results

**Survey:** Course evaluation  
**Status:** closed  
**Date:** 2010-06-13 11:44:49  
**Group:** Activated participants (DD2426 robot vt10)  
**Answered by:** 17(18) (94%)

---

Did you find the course interesting and meaningful?



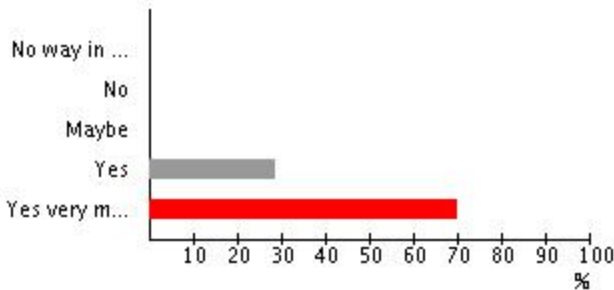
number distribution answer choice

0	0%	An utter waste of my time
0	0%	Not so interesting
0	0%	Ok
3	17,6%	Interesting
14	82,4%	Very interesting

17 has answered of 18 (94%)  
Maximum number of choices: 1

---

Would you recommend this course to a fellow student?



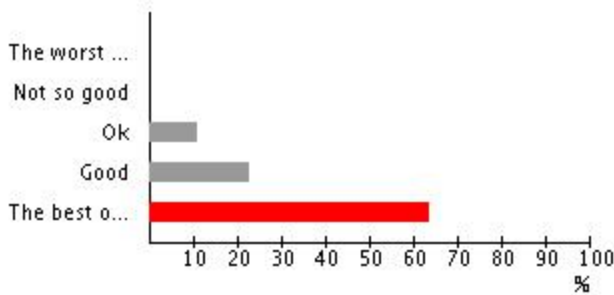
number distribution answer choice

0	0%	No way in hell
0	0%	No
0	0%	Maybe

5	29,4%	Yes
12	70,6%	Yes very much so

17 has answered of 18 (94%)  
Maximum number of choices: 1

How would you rate this course with respect to other project courses you have taken?



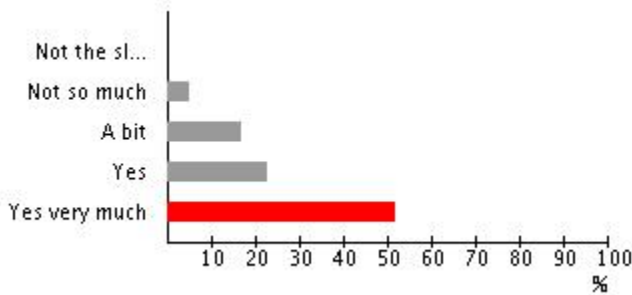
number distribution answer choice		
0	0%	The worst one I have taken
0	0%	Not so good
2	11,8%	Ok
4	23,5%	Good
11	64,7%	The best one I have taken

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- One of the best courses ;)
- Not enough credits for the amount of time you have to spend.
- Have not taken any other project courses
- best experience ever
- It has moving parts, say no more

Did this course make you more interested in robotics and robotics research?



number distribution answer choice		
0	0%	Not the slightest

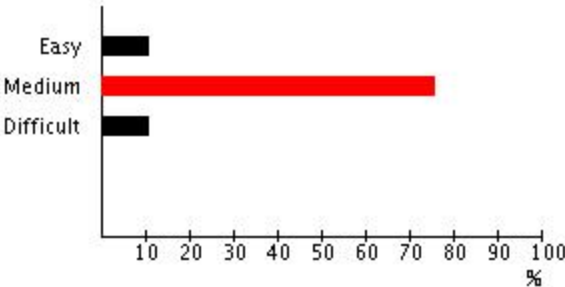
1	5,9%	Not so much
3	17,6%	A bit
4	23,5%	Yes
9	52,9%	Yes very much

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- I was already pretty interested.
- It gives you an idea of what you can do with robots in "real life".
- It was just a confirmation of that robotics is not so easy. I think it was not related to robotic research.
- i was been always interested in the robotics field but now, after this course, i'm sure that this will be my way.

How difficult was this course? (do not include time as a factor)

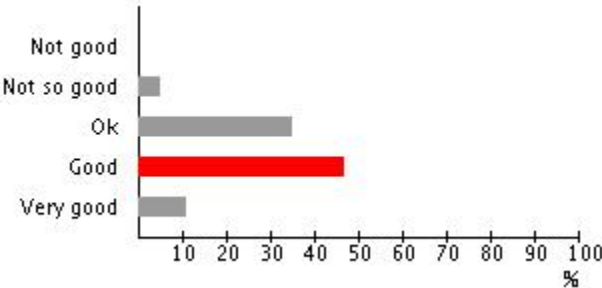


number distribution answer choice

2	11,8%	Easy
13	76,5%	Medium
2	11,8%	Difficult

17 has answered of 18 (94%)  
Maximum number of choices: 1

How did you like the lectures in general?



number distribution answer choice

0	0%	Not good
1	5,9%	Not so good

6	35,3%	Ok
8	47,1%	Good
2	11,8%	Very good

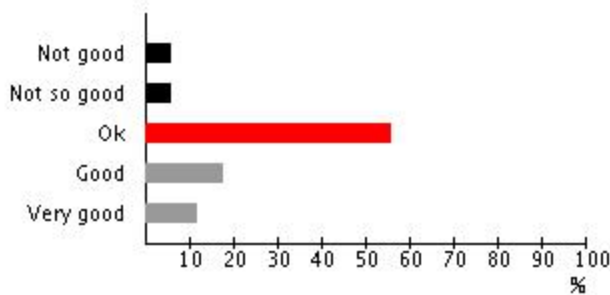
17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- Lectures are just some point. I mean it could be placed on a web site. No class and lecture needed for that content.
- i would suggest, if it's possible, to add at least one lectures about some usefull knowledge in c++ and Cmake
- The lectures were good, but they felt disconnected from the lab course.
- Didn't use much of the things I learned during the lectures when building the robot (a side from the control doc)

---

How do you like the book?



number distribution answer choice

1	6,3%	Not good
1	6,3%	Not so good
9	56,3%	Ok
3	18,8%	Good
2	12,5%	Very good

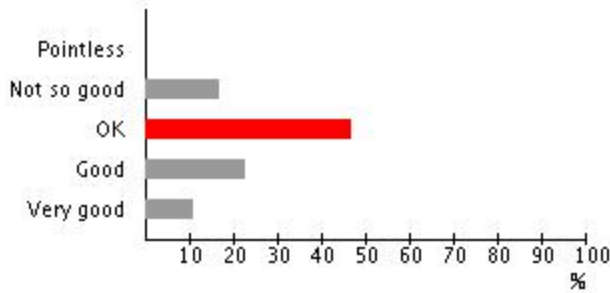
16 has answered of 18 (88%)  
Maximum number of choices: 1

**Comment:**

- did not buy it
- I didn't read it chapter to chapter.
- did not purchase, only read small parts out of friends book
- It was strange, some things were very advanced, but some things were just left undiscussed.
- Never really used it.

---

How did you find the group discussions at the end of the lectures?



number distribution answer choice

0	0%	Pointless
3	17,6%	Not so good
8	47,1%	OK
4	23,5%	Good
2	11,8%	Very good

17 has answered of 18 (94%)

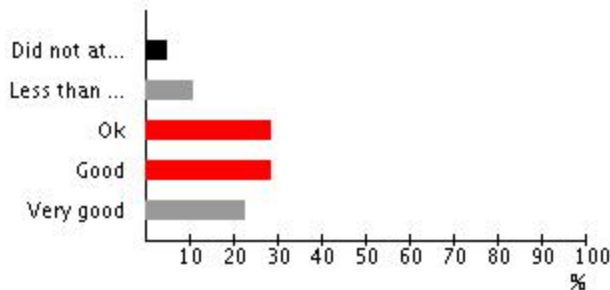
Maximum number of choices: 1

**Comment:**

- More time should have been devoted to these types of activities
- neat to clear up any confusion quickly
- very usefull to check what i effective learned and to have a chance to explain my point of view
- Good if you happened to sit next to people with an interest in the course, not so good otherwise.

---

How did you like Marins lecture where he gave an introduction to software development, C++ programming, etc?



number distribution answer choice

1	5,9%	Did not attend it
2	11,8%	Less than good
5	29,4%	Ok
5	29,4%	Good
4	23,5%	Very good

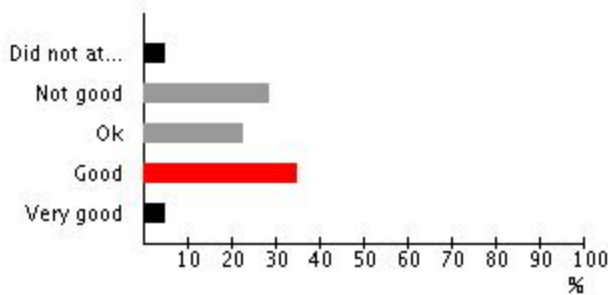
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- Sorry, but it was more about his carrier as a software engineer then about C++ etc.
  - I did however, discuss it with others to see what I missed and only heard positive comments.
  - I think it was totally pointless.
  - the lecture was very nice but not so much usefull maybe... just my opinion
  - great
- 

How did you like Faisal's lecture where he gave an introduction to control design?



number distribution answer choice

1	5,9%	Did not attend it
5	29,4%	Not good
4	23,5%	Ok
6	35,3%	Good
1	5,9%	Very good

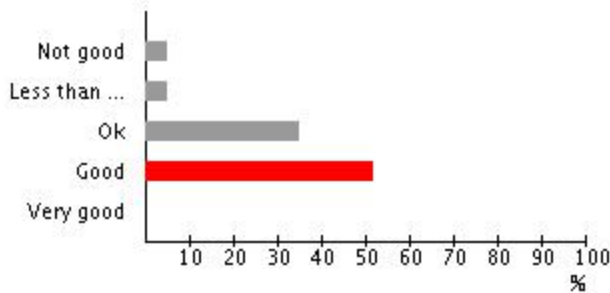
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- should have skipped the basics and gotten to the practical
  - Too much detail. You cant cover an entire course in Control Theory in one lecture and expect people to follow. The lecture should have been on Very applied control, i.e. how to make it work as simply as possible. The slides where pretty good for reference though.
  - The lecture notes where excellent.
  - It was too much information in too short time; it is impossible to cram all control theory into 2 hours. Skip the theory and the modelling. Just go through how to implement the digital controller in the code, which sampling time to use and how you hand-tune it. Spend 2 hours on this short info, but do it thoroughly, and people will get good motor controllers!
  - It was not an introduction but a recipe.
  - Those slides were a parody! They were good as a reference, but completely unsuitable for a lecture. Also, it went way over time.
  - The document was really helpful
- 

What do you think about the connection between the lectures and the project? Could you used what you learned in the lectures in the project?



number distribution answer choice

1	5,9%	Not good
1	5,9%	Less than good
6	35,3%	Ok
9	52,9%	Good
0	0%	Very good

17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- the lectures just scratched the surfaces of everything, there should maybe be more practical compartments.
- What I rememebered the most was how to do odometry and why the IR sensors should not be too close to their target objects. The rest was probably just interesting to have heard =)
- i have used not so much about what i learned in the lectures.

---

Would you suggest any additional literature for future students?

5 has answered of 18 (27%)

**Comment:**

- dont know
- C++ for dummies. Seriously.
- -
- a deeper lesson in c++ or at least about some usefull knowledge and in cmake
- -

---

General feedback about the lecture/theory part of the course

9 has answered of 18 (50%)

**Comment:**

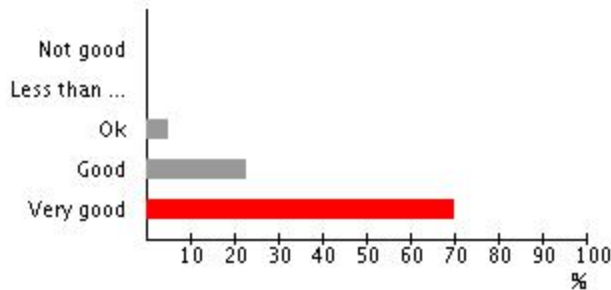
- It was good. I learned a lot of new concepts.
- I much more liked the project part. But since the lectures were only once a week, it was ok.
- -
- It was good and intresting.
- It should be more relevant to the project. I think it would be great if the lectures was more about algorithm and methods for control, planning, vision, etc. and there were a platform (something like that we do manipulator lab on it) that we play with algorithms and methods during the lectures as small assignment.
- not so much difficult.
- A bit hard to connect the theory and practice.
- It would be great if there could be some small compulsory c++-lab, just to familiarize everyone with c++ before the

project. It could be the sort of thing that takes only 15 minutes to do if you already know c++.

- It was good to get an overview of what is out there.

---

How did you like the project?

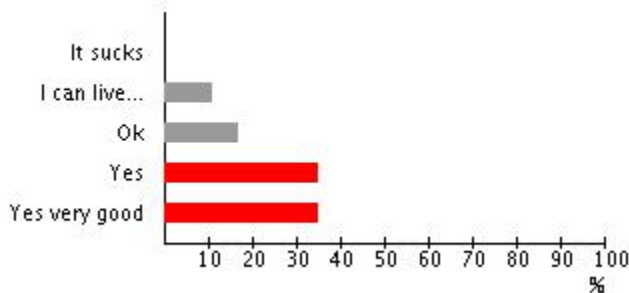


number	distribution	answer	choice
0	0%		Not good
0	0%		Less than good
1	5,9%		Ok
4	23,5%		Good
12	70,6%		Very good

17 has answered of 18 (94%)  
Maximum number of choices: 1

---

You were divided into groups partly based on your skills and NOT knowing one another before. Do you think that this is a good way to do it?



number	distribution	answer	choice
0	0%		It sucks
2	11,8%		I can live with it
3	17,6%		Ok
6	35,3%		Yes
6	35,3%		Yes very good

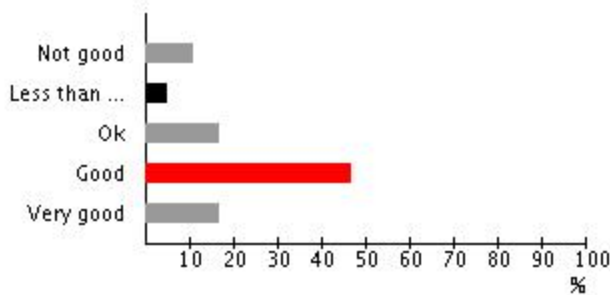
17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**



- I humbly suggest a stronger dissuasion of 3 person groups next year. While doable, the probability of a knowledge gap is quite high. Also, while I clearly could not test it, 4 people would probably have an easier time dividing up the work in a better way, such that 2 groups of 2 students work on the different modules rather than 3 groups of 1 students fail at communicating.
  - I cant think of any better way
  - VERY good with the dividing of the skills, absolutely! But add an extra element where you actually get to wish for people to do the project with. This wish can of course be overrun, but it is good to take it in to consideration to avoid making people disappointed.
  - It is a good idea yet performing this idea is not so feasible as I think skills are not estimated well.
  - yes but if people in a group split the project in different part they should anyway to talk and discuss toghether, otherwise they will learn less than what they could learn
  - I think groups should be sized to multiples of two, that way two people don't program "together" while someone is idling.
- 

How did your group work together?



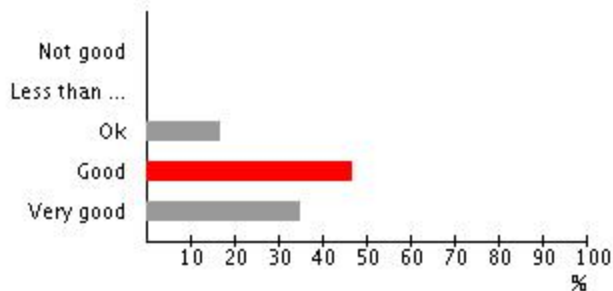
number	distribution	answer	choice
2	11,8%	Not good	
1	5,9%	Less than good	
3	17,6%	Ok	
8	47,1%	Good	
3	17,6%	Very good	

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- spent a lot of time in the lab together so we could integrate things smoothly.
  - We tried, but we suffered first from different schedules and lab times, and then from too few group discussions and demonstrations of what we had produced.
  - Somewhat lacking when it came to communication, other wise it worked fine.
  - The dividing of work is always hard. Maybe this is something that can be taught during a lecture or something??
  - very bad. There was people (not everyone) that didn't care about other opinion at all, shutting up me everytime that i tried to start a common discussion about algorithms.
  - No communication No initiative
- 

Overall, do you think that the help provided during the project was adequate?



number distribution answer choice

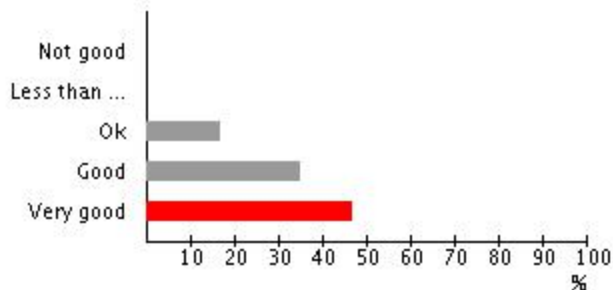
0	0%	Not good
0	0%	Less than good
3	17,6%	Ok
8	47,1%	Good
6	35,3%	Very good

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- Although a forum of some kind could be very useful, somewhere were the students can post programming questions in such a way that the rest of the class is forced to notice them. Anything that would aid knowledge spreading across the class would be a positive step.
- Yes, it was adequate. And then we could always send an email or ask you directly.
- teachers did a good job
- It was adequate for me, but I'm not sure about the rest of my group, I don't know if they all asked for help when they needed it. It would have been helpful to have more assistance before milestones and the contest.
- It would be great if you make it every 2 or 3 week.

What do you think about the help that Marin provided?



number distribution answer choice

0	0%	Not good
0	0%	Less than good
3	17,6%	Ok
6	35,3%	Good
8	47,1%	Very good

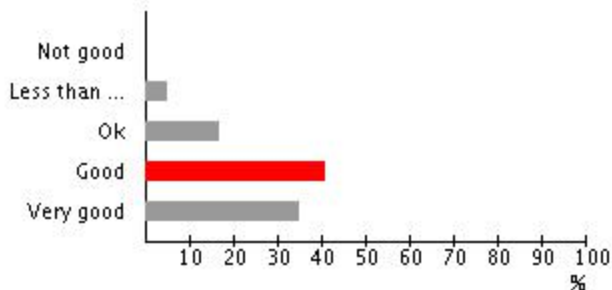
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- a bit wordy sometimes =P
  - Since he knows so much about the board and the software his help was very good and helped solve a lot of problems.
  - It was okay yet i feel it was not well distributed among groups.
  - just one little thing: sometimes he spends too much time talking with student of other group, making difficult ask help (is not nice interrupt two people that are talking)
- 

What do you think about the help that Faisal provided?



number distribution answer choice

0	0%	Not good
1	5,9%	Less than good
3	17,6%	Ok
7	41,2%	Good
6	35,3%	Very good

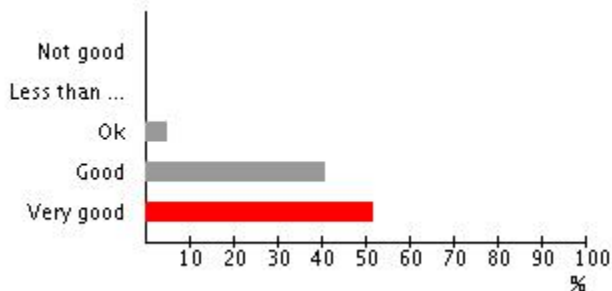
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- Sadly, it was not often one needed help with the control stuff since there was no time to make a really advanced controller. But how to make wires and so on was very helpful.
  - always interested to help us and to talk when we were not sure about what we were doing
- 

Overall, how did you like the software framework you were provided with?



number distribution answer choice

0	0%	Not good
0	0%	Less than good
1	5,9%	Ok
7	41,2%	Good
9	52,9%	Very good

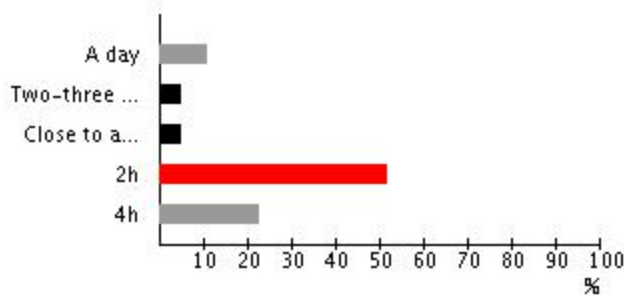
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- I kinda missed a `vprintf` version of `Log::Write`. For all other framework things I could implement a wrapper class, which meant I only had to work with the framework in the main method, the slightly inaptly named "board" .cc file, and in every single module that needed to log something.
  - It was good, yet it was too easy to use so that everyone dares to work with it. (its good that a framework be easy but not always)
  - is perfect, just sometimes using CMake i got some problems that no1 in my group understood
- 

How long did it take you to install the virtual machine and compile your first program. Pick closest option below



number distribution answer choice

9	52,9%	2h
4	23,5%	4h
2	11,8%	A day
1	5,9%	Two-three days
1	5,9%	Close to a week

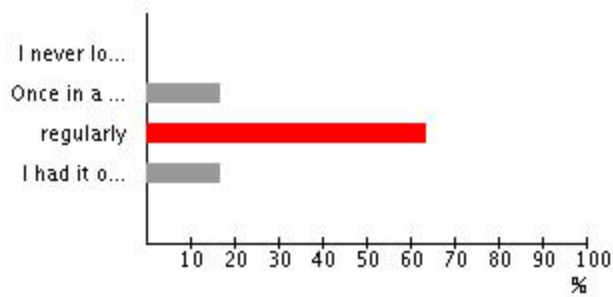
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- very easy
  - Although I lost the first week to migraine and then let my group show me. I did loose a lot more time to the virtual machine later.
  - The part that took some time was installing the virtual machine.. and that was due to various bugs not all related to the software provided for course.
  - Between 2-4 hours. The trick was to create a project in the correct way, then it was really simple. Maybe the wiki could be divided into the different softwares (Eclipse, geany, etc) instead of writing "skip this step if you are using.." - at least that is what I remember that screwed it up for me.
  - When I finally got around to install the virtual machine, it was done in a breeze.
-

Did you make use of the Framework Documentation?



number distribution answer choice

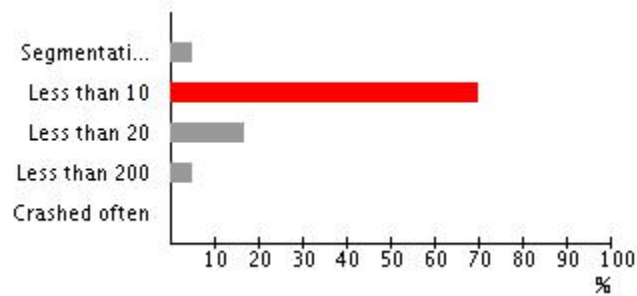
0	0%	I never looked at it
3	17,6%	Once in a while
11	64,7%	regularly
3	17,6%	I had it open all the time while I was programming

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- The documentation was almost as good as the java std. However, I never found anywhere where it stated that the timetools wait-functions do not work in xtasks. This gave me a lot of grief, even if I suspected it quickly.
- The best part is when there is an example provided when reading about a class or certain functions.
- It was not well documented. But it was better than okay for such a young framework.
- very usefull

How many segmentation faults did you get when programming your system?



number distribution answer choice

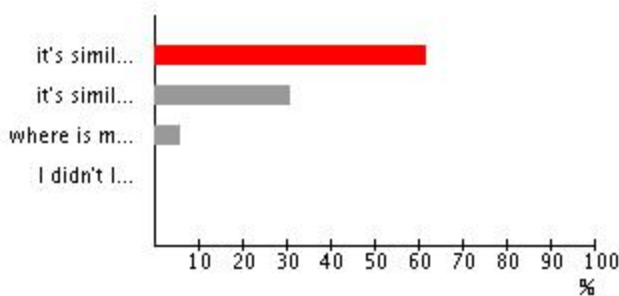
1	5,9%	Segmentation fault?
12	70,6%	Less than 10
3	17,6%	Less than 20
1	5,9%	Less than 200
0	0%	Crashed often

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- lots of infinite loops though
  - 2.
  - Don't think I got a single one myself...
  - When they occurred they were really annoying. But compile a lot and it will help you debug the code. PLEEEAAASE try to implement some kind of traceback like Java has =P 'segmentation fault' is NOT a helpful error.
  - less than 40 times for sure...
  - I have interpreted "your system" as the code that I wrote.
- 

How hard was it to get used to C++?



number distribution answer choice

10	62,5%	it's similar to C
5	31,3%	it's similar to Java
1	6,3%	where is my MATLAB? :(
0	0%	I didn't like it -- I prefer something else

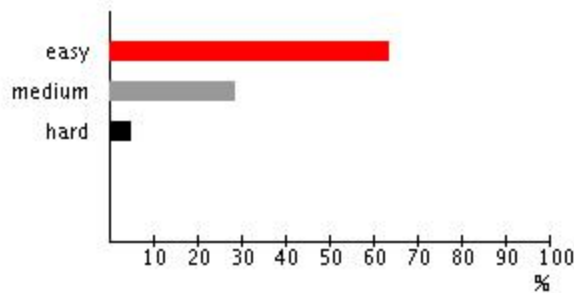
16 has answered of 18 (88%)

Maximum number of choices: 1

**Comment:**

- Why is there no "all of the above" as well as "I was already familiar with it". I did start enjoying c++/c more during this project. I've never really had cause to try to make the best of the language before, and it was a rewarding challenge.
  - it's quite similar to C/java, it was easy to get used to even thou I've not used it much before.
  - With experience from C and Java it was a walk in the park. Very good with the webpages with the clear examples on how to go from C to C++.
  - I was familiar with it.
  - was hard in the start learn all the difference with C.
  - Please no Matlab!! :)
- 

How hard was programming the Milestone 1?



number distribution answer choice

11	64,7%	easy
5	29,4%	medium
1	5,9%	hard

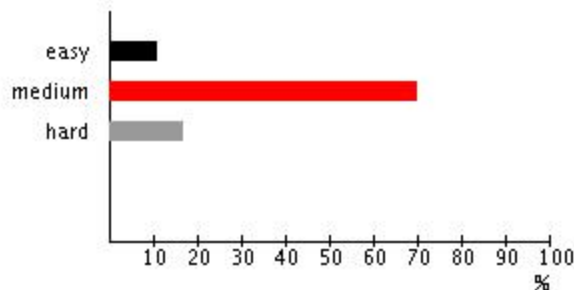
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- It takes some time to calibrate the IR sensors...
  - i have no idea... because was relative movement of the robot, in my group we didn't work good together and people preferred to not talk with the others to ask opionions (very very very bad)
  - I didn't program Milestone 1
- 

How hard was programming the Milestone 2?



number distribution answer choice

2	11,8%	easy
12	70,6%	medium
3	17,6%	hard

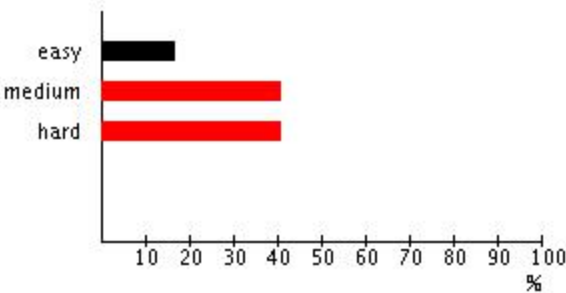
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- But this was mostly a tweaking problem expounded by poor understanding of the timer functions, which stopped us from getting correct sensor readings.
- i have no idea... because was relative movement of the robot, in my group we didn't work good together and people preferred to not talk with the others to ask opionions (very very very bad)
- I didn't program Milestone 2

How hard was programming the Milestone 3?



number distribution answer choice

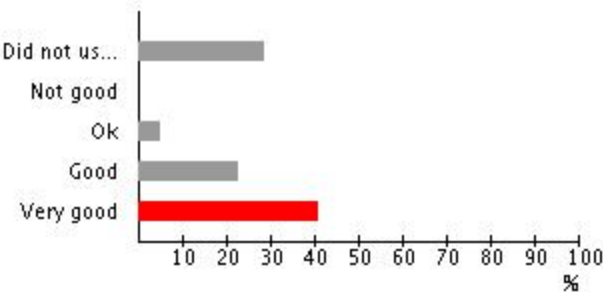
3	17,6%	easy
7	41,2%	medium
7	41,2%	hard

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- i have no idea... because was relative movement and camera vision of the robot, in my group we didn't work good together and people preferred to not talk with the others to ask opionions (very very very bad)  
- given milestone-2 working. The extra code for milestone-3 was the work of a moment, if by moment one means 3 days of unintensive work, of which one was tweaking the chase-ball code.  
- I don't know much about computer vision  
- The programming might not have been too hard, it was more the integration of the camera vision into the main code. It is important to do this at least a few days before the milestone!

Did you use Faisal's control design slides? How helpful were they



number distribution answer choice

5	29,4%	Did not use them
0	0%	Not good
1	5,9%	Ok
4	23,5%	Good
7	41,2%	Very good

17 has answered of 18 (94%)

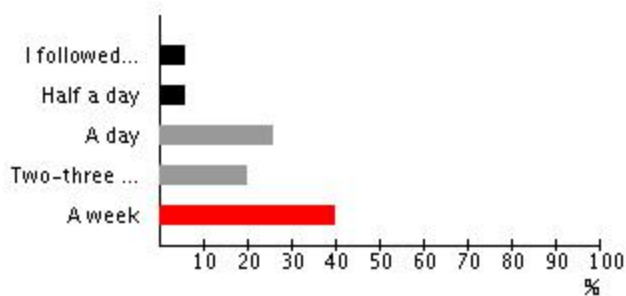


Maximum number of choices: 1

**Comment:**

- did not make the motion control part
  - While I read through all of it, I could have just skipped to the PID definitions near the end. They were awesome.
  - ..but only the slides with the digital controller (with the saturation protection) and the hand-tuning part.
  - i got only the opportunity to program the map
  - really helpful, thanks
  - They were a great kickstart to getting the robot move nicely.
- 

How much time did you spend on tuning the controllers



number distribution answer choice

1	6,7%	I followed Faisals recipe and it worked right away with his parameters
1	6,7%	Half a day
4	26,7%	A day
3	20%	Two-three days
6	40%	A week

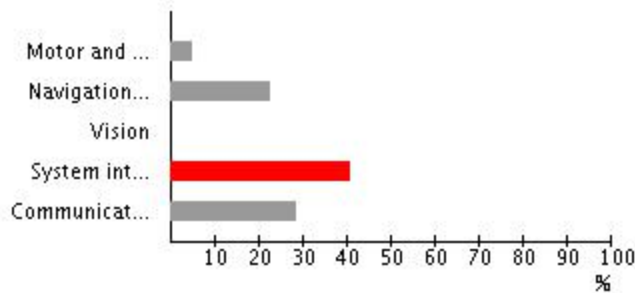
15 has answered of 18 (83%)

Maximum number of choices: 1

**Comment:**

- longer
  - Would have been less if I hadnt tried to add the 'D' part.
  - As long as you do a program where you input the PID parameters on startup it was fine, but having to recompile when chaning parameters is not recommended.
  - I didnt use it.
  - i have no idea. i got only the opportunity to program the map
  - In total. We had many control loops in many different places...
- 

Which of the following do you think was the hardest part of the project. Write other below if you cannot find your choice



number distribution answer choice

1	5,9%	Motor and motion control
4	23,5%	Navigation in the maze
0	0%	Vision
7	41,2%	System integration
5	29,4%	Communication within the group

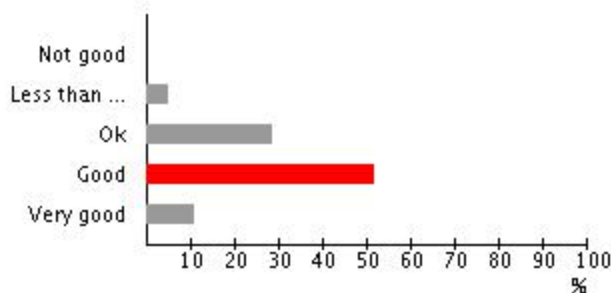
17 has answered of 18 (94%)

Maximum number of choices: 1

#### Comment:

- Since all the part are not designed well integration was not so easy.  
 - i cannot say anything about other thing because people that were programming motor and motion control, navigation in the maze and Vision didn't care at all to talk with me and the other person that was programming the path planning. Just we 2 were often talking toghether explaining our ideas and choising the best solution (for our point of view of course)

How did you like the contest event at the end of the project?



number distribution answer choice

0	0%	Not good
1	5,9%	Less than good
5	29,4%	Ok
9	52,9%	Good
2	11,8%	Very good

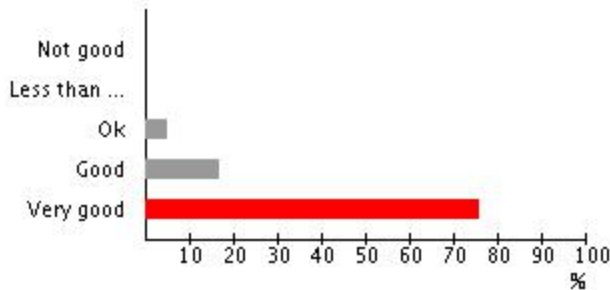
17 has answered of 18 (94%)

Maximum number of choices: 1

#### Comment:

- It should have been more of a spectacle.
  - motivating
  - I liked the idea, how ever the amount of last minute work we did somewhat ruined the experience of the contest.
  - It was great fun to see how your robot did compared to the other groups! And it was good that you said that it really was not a competition.
  - It evaluation and scoring was not good and fair. Also, I think course leaders attitude before the contest was "Yes, that group would be the first let's find who will be second" and it was not fair.
  - the best!
- 

How did you like the idea with each group having their own tools and components?



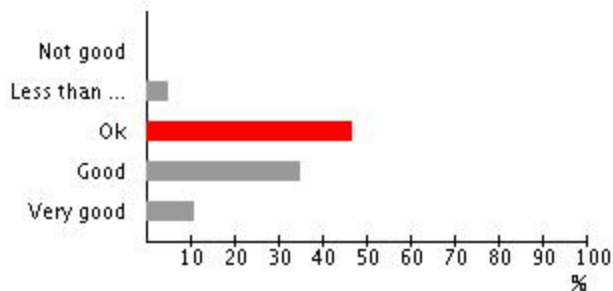
number distribution answer choice		
0	0%	Not good
0	0%	Less than good
1	5,9%	Ok
3	17,6%	Good
13	76,5%	Very good

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- Lifesaver. Then again I dont know if every group needed there own hot air gun.
  - would be very annoying to have the "good" tools missing all the time
  - But once again I would like to give feedback on the heat-guns: Too big. Leave 2 or 3 in the lab, that is 1 or 2 more than needed this year.
  - It worked very well, I could always get the tools I needed right away.
  - Perfect. And *\*everything\** was labeled with the group number - even better!
  - absolutly necessary
  - I don't think we all needed that heat gun thingy, it mostly just took up space. The same goes for other rarely used tools that I don't know the name of. We could also probably have shared the tape. A pair of scissors for every group would have been great though.
- 

How did you like the workshop in room 1621? Did it have what you needed?



number distribution answer choice

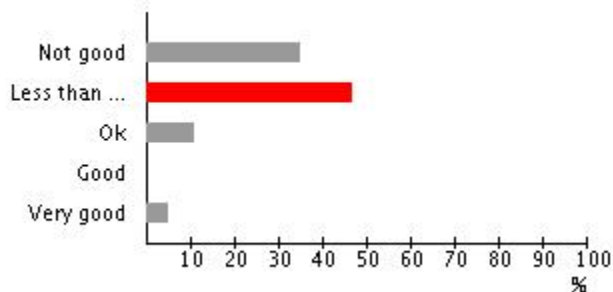
0	0%	Not good
1	5,9%	Less than good
8	47,1%	Ok
6	35,3%	Good
2	11,8%	Very good

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- just missing a welder, or maybe i have not see it at all.
- Didn't use it much.
- unfortunately the spring of the drill press was broken
- to hot. AC!!
- rickety drill, wasn't completely stable. (in the 1st half of the project anyway) otherwise pretty good
- A coffee maker would have been a nice addition! Somewhat lacking air conditioning.
- It could be better if it had more windows or an air conditioner as it was too hot. (Even for me coming from a country with 35-40C summer)
- Needed air, and an occasional sweep of the floors, but it was good.

How did you find the lab computers?



number distribution answer choice

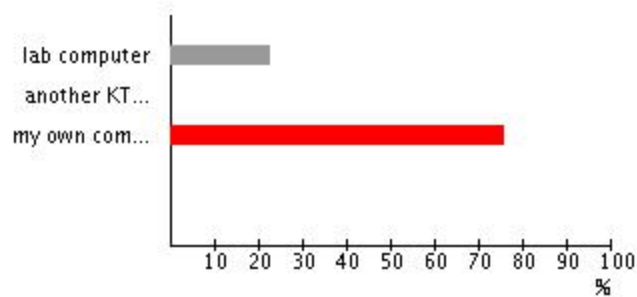
6	35,3%	Not good
8	47,1%	Less than good
2	11,8%	Ok
0	0%	Good
1	5,9%	Very good

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- Sloooooow. Nice screen though.
  - too slow
  - sloooooooooow
  - The VM worked horribly on them.
  - Very slow compared my laptop so I didn't use it all.
  - Too slow =( You really do need to have your own laptop.
  - very slow...
  - although they were slow.
- 

Where did you do most of the software development?



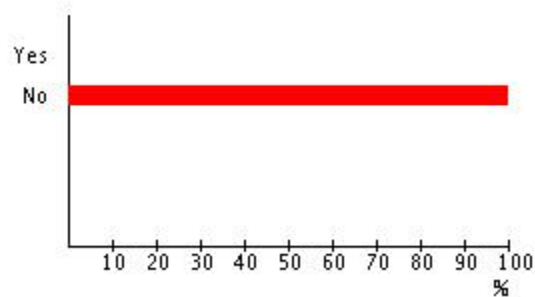
number distribution answer choice		
4	23,5%	lab computer
0	0%	another KTH computer
13	76,5%	my own computer

17 has answered of 18 (94%)  
Maximum number of choices: 1

**Comment:**

- My laptop again.
  - faster to compile
- 

Did you miss any software libraries? If yes, specify below



number distribution answer choice

0	0%	Yes
17	100%	No

17 has answered of 18 (94%)

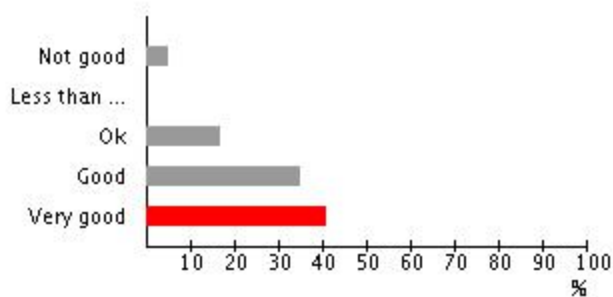
Maximum number of choices: 1

**Comment:**

- ???

---

How did you like being provided with a virtual machine to develop in?



number distribution answer choice

1	5,9%	Not good
0	0%	Less than good
3	17,6%	Ok
6	35,3%	Good
7	41,2%	Very good

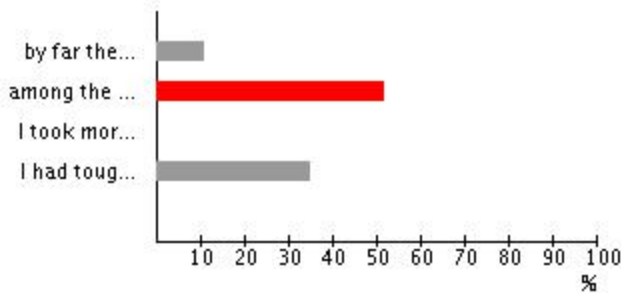
17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- Good idea.
  - I guess I understand the problem, but really. Most of the laptops used by the students in the room had ubuntu running an ubuntu VM.
  - probably the easiest way to compile this kind of program.
  - Its nice to have everything set up so quickly. But the virtual machine was also causing some headaches.
- 

How big of a software project was programming the robot for you?



number distribution answer choice

2	11,8%	by far the biggest for me
9	52,9%	among the more complicated programming tasks I did
0	0%	I took more demanding project classes at KTH
6	35,3%	I had tougher projects outside of KTH

17 has answered of 18 (94%)

Maximum number of choices: 1

#### Comment:

- It was the biggest project I've done at KTH.
- As far as programming goes, this was in the top two.
- very big, but also if we failed i m sure that is not impossible at all finish it in a performant and complete way. Anyway was very nice programming for this project.

---

Comments in general about the hardware (computers, motors, sensors, ...) and how it could be improved

9 has answered of 18 (50%)

#### Comment:

- new model motors, new computers.
- It was all pretty good. I think the motors and batterys are getting a bit old though
- faster computers were nice
- we had a lot of problems with the wheel coming loose from the axis of the motors. Better tools/screws for fastening the wheel, we may also be newbs, or maybe had bad parts. this I never tried myself but a group member said that the gyro had to much noise to be used in an efficient way, our odometry according to him worked better at pose estimation. Don't know if its true though, maybe he misused it somehow. wheel encoders on the castor wheel or something similar would be nice. faster board so you don't have to think to much about efficiency maybe. But thats also part of the fun.
- The batteries where my biggests problem by far. Especially in the first weeks/ half of the lab-time a power source with some extention cables would have been super. A lot of the problems we had may have been due to bad chargers.
- It worked well, and any issue with broken components was addressed very quickly. The swedish edition batteries last much longer than the old ones.
- A IR speed sensor could help much. You can provide it with less than 10 USD.
- maybe with some other component will be possible have very different robot between groups. At the end all the robot are almost the same, and probably should be more funny and interesting if , introducing more components, people had more choiche about how develop the robot.
- It was not clear what sensors we had available...

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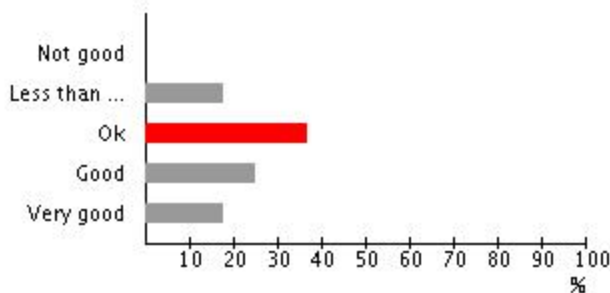
Comments in general about the project

8 has answered of 18 (44%)

**Comment:**

- Next year, really try to promote people to think more freely about the design of the robot. All the robots this year looked almost identical. Perhaps some credit for the most inovative detail or something like that. If I where to do it again I would mount all six IR:s in a semi-circle and have the servo rotate it slightly and by doing so get a "poor mans laser scanner".
  - I wish I had implemented the map in day one, and based the navigation code from it from the start.
  - It was good and alot of fun, however it consumed very much time.
  - Again: More credits for the amount of time you have to spend.
  - There were not way for innovation and as you see all the robots was mostly the same. You can modify the robot requirements.
  - best project ever
  - Ours was really unstructured. Which is kind of amazing, given that there was a weekly documentation of progress.
  - It was perfect and as I mentioned best experience ever
- 

How did you like the debriefing session at the end of the course?



number	distribution	answer	choice
0	0%	Not good	
3	18,8%	Less than good	
6	37,5%	Ok	
4	25%	Good	
3	18,8%	Very good	

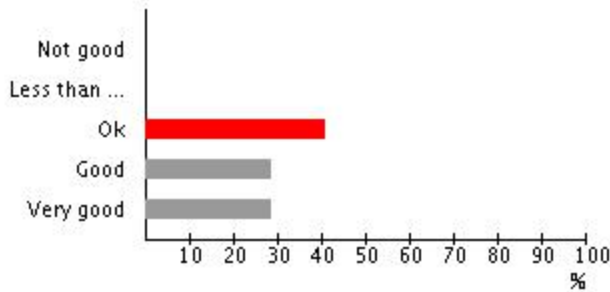
16 has answered of 18 (88%)  
Maximum number of choices: 1

**Comment:**

- it was interesting to hear from the winning group. some things keep repeting it self
  - Which one?
  - sometimes too detailed. If you only were familiar with a specific part of the robot software you did not understand everything what people of other groups presented.
  - be more hard on the time limits. Some people got way to much into technical details. got a little booring considering every had spent the last 3 months on the robots.
  - fun to see how others solved the same issues
  - I regret missing it more than any other regret relating to the course. More, in fact, than not being able to give just one more day to the map after the contest.
  - It came like a shock since we had not checked the calendar. But it was good. But be sure that people stick to the time frame! And basically no group spoke about what you asked them to, they just explained their algorithms - which were quite similar in all groups.
  - just too short! we need more time to explain in a good way our ideas.
- 

What do you think about writing the self/group reflections?





number distribution answer choice

0	0%	Not good
0	0%	Less than good
7	41,2%	Ok
5	29,4%	Good
5	29,4%	Very good

17 has answered of 18 (94%)

Maximum number of choices: 1

**Comment:**

- Probably a good idea, I'd somewhat lacked time to write them properly.
- It got you thinking of how you actually performed and what you learned!
- .
- Don't really see the point since no one will see them, sitting down discussing it would have been better.

---

What would you to say to a potential student about the course in one sentence?

13 has answered of 18 (72%)

**Comment:**

- Fun project that takes a lot of time
- discuss together and choiche together how to develop the robot and algorithms. Otherwise kick out everyone that doesn't want to discuss.
- Robot building is harder then you can expect, but a lot of fun.
- It is very nice to try to apply learned stuff and then you will see that there is a difference between theory and practical application.
- probably the most fun and nerdy course I've taken.
- an awesome mechatronical exercise you should read IFF you have the spare time.
- "Hell yes." Then, because this is a short sentence, I would go on to say: "Don't panic." If I had more sentences, I would go on to relate this to the programming part.
- If you'r very intrested in robotics this is an awesome course!
- You get to build and code your own robot - from scratch!!!
- If you are not a good programmer, please please please dont write a single line of code.
- Spend some time to design the robot, don't just hack and slash a robot together.
- Don't be shy about suggesting improvements of your team mates' programs and ideas, sometimes you do know better!
- Keep It Simple, Stupid!

---

What would you liked to have seen changed if the contest was run again? Any rule changes? Anything else?

12 has answered of 18 (66%)

**Comment:**

- It would be fun to compete in somewhere public, but I understand if the light conditions prevented that.
  - nothing
  - I don't think the rules quite worked. Feels like the rules were very oriented around vision and detection of balls etc, didn't really reflect how well the robots worked. I think you should mix the point system with the teachers and assistants being judges and giving opinions on how well the robot actually does different things. For example a robot can randomly drive around, bump in to walls, make some detection, pick stuff up etc. and get a good score, but that doesn't mean that the robot performs well. You could judge stuff that are hard to put point on. Like how well is ball detection and catching integrated with navigation? How predictable was the behavior/navigation? and many more similar things that would be better of being judged by you. I don't think anyone would mind or be sad if you gave your honest opinions about how you think the robots performed.
  - a new labyrinth setup would have been exiting
  - I would have liked to know that the bombs would be "kindly" placed. I was working on the theory that we would have to navigate past them if they where in a corridor, keeping to one side. Other than that, I think a grade scale for the priority lines which gives something for almost functioning detection may be positive. There is however a point in letting the contest only give points to perfect implementations, e.i. only give bomb avoidance points if the bombs are, in fact, avoided, and only give priority points if the bombs are picked up in order. Whatever way is chosen, it should be stuck to.
  - Not that I can think off...
  - Allow two separate runs of maybe 5-7 minutes each, if needed.
  - 1-Run some specific contest. e.g. vision contest, control contest, planning contest as well as an overall contest. 2-Give score to almost anything (specially something that can not be on a single robot at the same time)
  - nothing. just some people in the group.
  - Robot's design.
  - I think you should be allowed to restart your robot more than one time, as long as you don't do anything to change it's pose.
  - A different maze then the test maze, that would prove that the robot was thinking for itself and that we had created a robust robot. Using the old maze was kind of a disappointment.
- 

Things you liked about the course?

13 has answered of 18 (72%)

**Comment:**

- The organization. The labeled tools and hardware. The devotion to the students. It was all pretty good.
  - one could do the programming when ever and where ever one liked to
  - I learned how to apply in real life what I had learned before (and it is completely different ^^).
  - the entire project was very fun.
  - I got to build a robot. The whole course. Every last bit about it. But the teachers / lab-assar where really good, and did not have the benefit of being a course that lets you build a robot, so they had a harder time of it.
  - Most of it! Only exception was the last 1-1½ week, there was alot of things left to intergrate and I was very busy with exams and tasks from other courses.
  - I learned a lot about robotics. It was fun to see how things that should work in theory does not always work in practice.
  - It's chalanging
  - to program a robot! and also the help provided by teachers
  - "Weed talk" with Marin.
  - Almost everything! Good lecturers, good lab assistants, fun project, colourful tape...
  - Everything, making groups and being communicative and keep in touch with everybody and of course support.
  - Building the robot.
- 

Things that could be improved about the course

11 has answered of 18 (61%)

**Comment:**

- Perhaps it would have been an idea to start the project mid first period, so you could get started earlier.
- dont feel that anything was bad or needs big improvements besides the temperature of the lab room. Buy cheaper robot parts and put in an AC instead. Also fix so that all windows can be opened.
- I tried to give feedback during the course on specific things, because I knew I would not remember them here. The things I had problems with, however, where: \* Batteries \* The VM \* TimeTools did not function for XTasks The toolbox was also not perfect. The tools barely fit, and there was little space for organizing the tools we had. Chaos reigned, and while this was not a problem for us, it could very well have been. Something with more compartments, maybe? Also, the error message when submitting a course eval which is missing answers to some questions would be more useful if the questions where numbered.
- The only down side was the amount of time \*required\* compared to the credits given for the course.
- 7.5hp?? at least 12hp and more interesting task(s).
- lab computers.
- There could be a "master plan to robot completion"- assignment together with milestone 1. That way groups would have to form and agree on some sort of plan describing how they will complete the project. At the same time they will have gathered some experience using the framework. This would help struggling groups go back and look at the plan...
- A coat hanger for the lab would be nice.
- Maybe an initiation to collaboration tools, code sharing tools. Maybe also suggestions of workflows...
- I'd really like to tell you to have discussion session more often rather than having once during the project, cause it may help to make group to communicate with each other and in one word would be nice, thanks.
- A little less bureaucracy. Progress statements every week was tedious. More transparency what all hand-in tasks meant for the grading. Building the robot was for fun, but all other stuff you only do for the grades, that's why I want to know what the minimum requirement for a grade is. Hate to do more work than needed.