

# courseApp

IFI course application for  
Android

Wonder Document II

By

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# Introduction

Our plan in this semester project is to develop an android mobile application which allows the users to browse the available courses on department of informatics at University of Oslo. We hope to give students enough flexibility to surf easily through all courses available, add them to their watch list, receive latest updates from the courses added, and even update their Android calendar with the important dates for their chosen courses(deadlines for assignments, exams, etc).

# Background

The background of our group is kind of different from each other, but what we share is a common desire for production and development which motivates all of us to start this challenging project. We are from different study groups varying from Nano-electronic, Robotics to Network and administrations and one of us who takes free courses at IFI. What we all want here is to learn more about Android development world and learn how to use all the possibilities around it, either in later at work or in our master thesis.

The background for this idea to make an application for easier surfing through courses, came from students frustration of the very outdated, non-structured course lists at departments of informatics(see figure-1). The idea is to give students the chance to surf through the available courses in an easy and structured way that they do not need to go through 190 courses at IFI to be able to find out available courses which are related to robotics or mobile technology. This dilemma more and less applies to all institutes and faculties at University of Oslo.

UiO : Universitetet i Oslo

Søk i Universitetet i Oslo Søk

Forsiden Forskning Studier Livet rundt studiene Tjenester og verktøy Om UiO Personer

Studier

Emner

Matematikk og naturvitenskap

- Informatikk

### Emner innen informatikk

Vis kun emner i denne kategorien med

- [Undervisning våren 2011](#)
- [Undervisning på engelsk](#)
- [Undervisning høsten 2011](#)

#### 190 emner i denne kategorien

- [INF1005 - Informatikkens verden](#) (5 studiepoeng)
- [INF1000 - Grunnkurs i objektorientert programmering](#) (10 studiepoeng)
- [INF1010 - Objektorientert programmering](#) (10 studiepoeng)
- [INF1050 - Systemutvikling](#) (10 studiepoeng)
- [INF1060 - Introduksjon til operativsystemer og datakommunikasjon](#) (10 studiepoeng)
- [INF1080 - Logiske metoder for informatikk](#) (10 studiepoeng)
- [INF1100 - Grunnkurs i programmering for naturvitenskapelige anvendelser](#) (10 studiepoeng)
- [INF1300 - Introduksjon til databaser](#) (10 studiepoeng)
- [INF1400 - Digital teknologi](#) (10 studiepoeng)
- [INF1411 - Elektroniske systemer](#) (10 studiepoeng)
- [INF1500 - Introduksjon til design, bruk, interaksjon](#) (10 studiepoeng)

Figure-1

## User interaction, goals and methods

Our target users are first of all students at department of informatics at university of Oslo as they are the ones who actually use the current outdated system. This target group provides us a very good opportunity for both testing purposes and a big number of potential active users. After discussing our target group in our developing team, we came up with following assumptions.

- The students visit course pages very often.
- They are frustrated over lack of a channel for being informed about latest updates with the courses they take.
- It's difficult to surf web pages that are not designed for mobile users (UiO course pages).
- There is a large number of students with Android smart-phones at IFI.
- Usually IT students are more eager to try new applications/gadgets.
- Informatics students have better understanding about the development process which can bring lots of useful feedback to us.

To use and interact with this big potential target group, we have decided to use a combination of both qualitative and quantitative methods to collect academic data. This would both help us to find out if our assumptions were correct, and also would let us know about the needs of our target group. As for qualitative we decided to go for interview as it is more accurate than simple observation and the discussion with interviewee can inspire us in our development process. Our

favorite quantitative method was statistical survey. An easy way to collect data which we did it by making a survey application in [Google Docs](#), and spread the participation link among students by Email. This choice of ours and the advantages and disadvantages around it are discussed in details later in this part.

It's also necessary that although we did not have any need for storing sensitive data, we have taken into account the *ethical issues* around our research. This was done by collecting all the data *anonymously* with no sensitive data being stored when it applies to our survey. This strategy has been also followed in interviews by hiding the real identity of interviewee.

## Interview

Interview is always a powerful tool to both find out about the needs of potential users and at the same time get inspired by their ideas(A SOURCE ???). In advance we had prepared some questions that we would like to ask the interviewee about, but at the same time we wanted it to be an open-ended interview, which means that we tried to make it more like a conversation, focusing on one specific topic (Preece, Roger and Sharp, 2007, p.289). Under an open-ended interview it may come up new information and ideas that were not anticipated. The advantage of this method is that the interviewer(here the developer team) would be inspired by the ideas of the interviewee. A disadvantage with this method is the quantity of unstructured data that are generated. This can be very time-consuming to analyze (Preece, Roger and Sharp, 2007, p.289).

For this phase of our project we have interviewed three students at departments of informatics. Following points is the summary of their needs and ideas for such application(Detailed information about the interviews can be found under [Appendix I](#)). We should mention in advance that some of these needs or better said wishes can not be implemented in an application without necessary infrastructures and new services from both departments of informatics and university of Oslo(Video streaming of lectures, more standards about course pages, etc). Therefore the findings are divided in to two groups, called *realistic* and *wishes*.

### Realistic :

- Easy surfing through courses
- Categorizing and tagging courses not only by institutes but also technology(robotics, image processing, design, etc)
- Update Android calendar with the deadlines and important dates about the desired courses
- Warnings about both important dates and new updates on screen(Notification)
- Latest updates on the course pages
- Support for several platforms and not just Android

### Wishes :

- Ability to join courses on the app(Join button)
- Ability to download course presentation
- Possible video streaming of lectures in future

## Survey

One of the questions that came up after submitting the first wonder document, was if we could prove that there are many students carrying Android based smart phones around(or even if most of students own a smart phone). Although there exist number of researches proving that shows the rate of smart phones vs. simple phone, and also researches that show Android as the dominant operative system in the smart phone market, but we have decided to run our own local survey to have our own academic results exactly from our own target group. The survey method in this project is *online surveys*, as it is a method which is know to be easy to implement and administrate, low coast, little time consuming and *very fast* as the researchers have access to the feedback right after participators have clicked on send button. We are also aware of the disadvantages with this method like the issue of honesty in answering and the role of manipulation of result by Internet robots(We tried to avoid simple HTML forms and use Google tools to prevent this one as much as we could). The survey for this was made in Google Docs and the participation link was later distributed by Email to all of the students we knew, and again redistributed by them to other IFI students. We believe the result from this academic research can back our assumptions. You can see the results of our quantitative research down here.

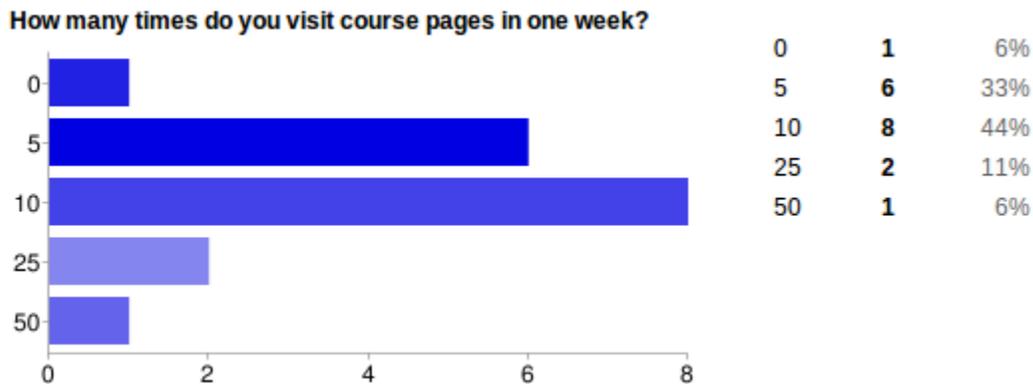
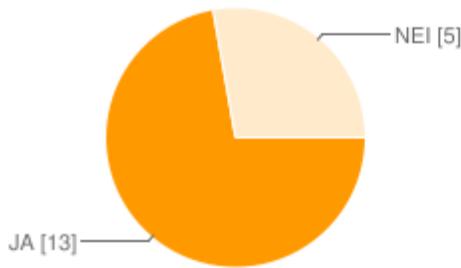


Figure-1

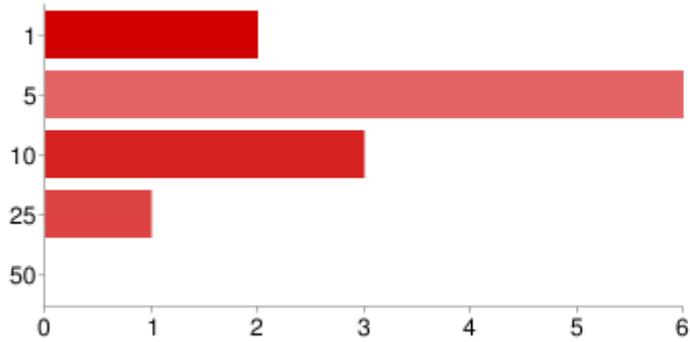
**Do you use your mobile phone to visit course pages?**



JA	<b>13</b>	72%
NEI	<b>5</b>	28%

Figure-2

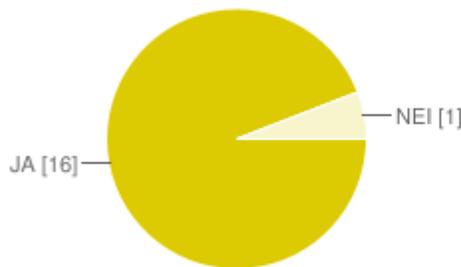
**If YES, how often ?**



1	<b>2</b>	11%
5	<b>6</b>	33%
10	<b>3</b>	17%
25	<b>1</b>	6%
50	<b>0</b>	0%

Figure-3

**Do you have a Smart Phone ?**



JA	<b>16</b>	89%
NEI	<b>1</b>	6%

Figure-4

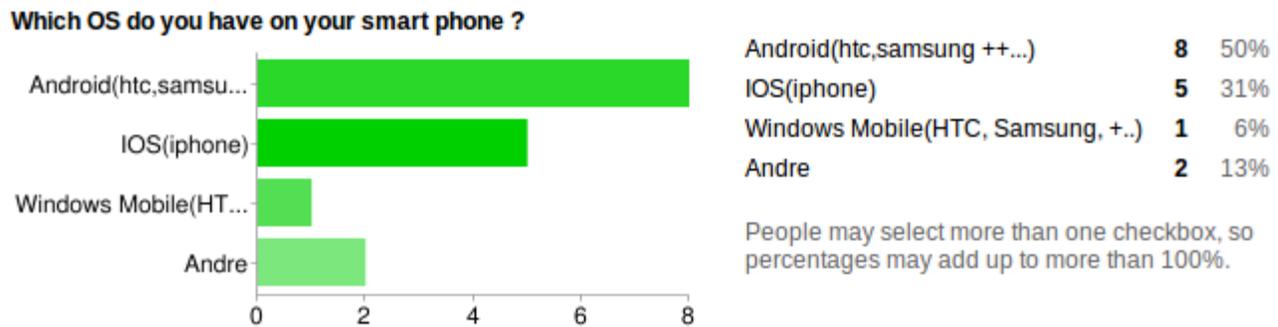


Figure-5

Up to now we have eighteen participants and we are hoping to have even more as we have started to even distribute this survey between the students taking INF5261, Information systems, at IFI. We believe it is too early to start analyzing the results, but the results up to now totally supports our assumptions about the students interest in checking course pages(Figure2, 3 and 4), Smart phones to be the dominant telephone device among IFI students(Figure 5), Android to be the dominant OS in IFI(Figure 6), and students willing to be able to check this on their mobile phones easily(Figure 3).

## Practical work

### Tools

In order to develop any application on Android operative system, one needs to install [Android SDK](#)(2). The Android SDK in addition to [Eclipse IDE](#)(3) is the most recommended choice to start development phase. We used the latest version of [Eclipse IDE for java developers](#)(4). In addition to these two, there is also need for installing an extra plugin in Eclipse to connect the IDE to the Android SDK. This plugin is called [ADT plugin for Eclipse](#)(5) developed by Android SDK developing team.

As none of us had any experience with Android programming, and like most programmers we sat down after graving the development kit, and wrote a “Hello World” application. It was a good start and we did run it by the Android emulator. This was quite a slow process from pushing the run button to getting merely the short text “Hello World” printed on the screen. Soon we came to know that we could save ourselves quite some time if we connect the phone on the computer and ran the application directly through it([USB debugging](#)). We do recommend

this method, but the disadvantage of this method is lack of a very good logging system which exist on the emulator. In case of sudden crash which can happen quite often, as every source usage should be declared in advance, it is a good idea to have a good logging system to go through(permissions issue will be discussed later).

## Cooperation with USIT

As the primary things were set up, we could move on to the real business; courseApp for android. To make this come true, there was a need to access information about the courses. For this purpose we contacted the web section of University of Oslo where we made a query about whether we could get “read” access to the course database of university. We initially wanted to be able to at least have read access to the “last messages” from the course and get information about the lecture timings and location. We were referred to contact with people in charge in USIT, where they finally came up with a solution that was helpful. We were not granted access to the database system, but we could use an [XML-document](#)(7) or an [RSS-document](#)(8) in order to satisfy our needs. They also mentioned that they are very interested in our project and they would like to know the results(see [Appendix II](#) for the details).

## Technology

The next challenge was to find out the best way to read this pile of information in the best possible way. We came across a number of different technologies to [parse](#) XML documents and acquire information. Some of the common XML parsers are [SAX](#), [XML PULL](#), [Feed Parser and DOM parser](#)(9). After trying out the SAX parser and DOM parser. As the choice of the XML-parser depends on which kind of application one wants to develop, we decided to go for the DOM-Parser because it was favourable for using when one had to read from smaller documents(9). After a few failed attempts we finally succeeded in parsing the XML document for the course code INF3100(7,8) and got it to work. It is worth mentioning that one needs to make some declaration in the file *manifest.xml* which is found in the root of the project folder. In this file you can define which resources(components) of the device, the application would have access to. This issue is called permissions and is very vital while developing. In case of forgetting to mention permissions in advance, the program will crash on your device with no understandable error code. It is here that using the emulator can be a huge help, as there is a good logging system present, which can help you to find out the reason for crash.

## Prototype, Ready

As per now, we have tested all the technologies needed in this project and right now we have a functional XML parser application that can read all the latest updates from any course at IFI. This prototype enjoys stable functionality, while it has very little user friendly graphic user interface. This application was shown to several students at IFI and the response even for the

prototype was more than expected, as they asked us if they could get it on their own phones, or even we were asked by iPhone users, if there is a corresponding application with similar features for iPhone.

## Further Work

Our goal as mentioned is to provide a better course management and viewing application and we will try our best to deliver at least a functionality which enables the students to hold track of their courses in an easy way. Having said that, we have a limited time schedule to complete this application and we will probably not be able to implement all the functionalities that we have planned to. For development in the future by both the departments of informatics and the other students who may want to add more modules to our work, we can advise the following features which are either our own ideas or are extracted from the research which we have done in this field on students at IFI.

### **Structuring the courses**

Students feel the need of a better categorizing and structuring of the course lists. Categorizing courses and tagging them by technologies can be advised. This should be done by authorities at IFI or USIT.

### **Student web access(Join button)**

As per now, there is no access for the students to log on to the student web through an android application. We are planning to contact the web-section of UiO at USIT, in order to be able to provide this functionality in later versions.

### **Video streaming of courses on your device**

There have been rumours that in the future there will be podcasts of the lectures and maybe video streaming. These all can be played on such device.

### **Improve the definition of XML rules**

The department of informatics should consider defining more restrict XML tags for all important dates and headings. An example we have hit in is that the date for examination in a course is given in XML format while the date and timings for submitting assignments are not.

## Conclusion

As per now, we have tested all the technologies needed in this project and right now we have a functional XML parser application which lacks a good graphic user interface. In the near future, we will come up with a interactive, user-friendly and easy in navigation. For this we have to do some study and research i.e for choosing colours, layout, font-colors etc. Further development

of a user friendly GUI, testing it on test users and finally publish the application on the Android market, where every student at IFI can download it, are our final steps.

## References

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3. Eclipse Foundation : <http://www.eclipse.org/org/>
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5. ADT plugin for Eclipse : <http://developer.android.com/sdk/eclipse-adt.html>
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7. XML sample, UiO website :  
<http://www.uio.no/studier/emner/matnat/ifi/INF3100/v11/beskjeder.xml>
8. RSS sample, UiO website :  
<http://www.uio.no/studier/emner/matnat/ifi/INF3100/v11/beskjeder.xml>
9. IBM tutorial for XML parsing on Android :  
<http://www.ibm.com/developerworks/opensource/library/x-android/>

## Appendix

### Appendix I

The interviewees were three students at departments of informatics at university of Oslo.

Student 1 :

Nickname : Kian

Age : 23

Sex : Male

Interview date : 10.03.2011

Duration of interview : 10 minutes

Place of interview : Physics building

Method : Note taking and no recording as we believe recording would make interviewees uncomfortable

Notes from interview :

The interviewee owns a Samsung Galaxy S smart-phone which runs Android 2.2.

He is not familiar with concept of programming for mobile devices but he believes it is a very

interesting concept.

Kian believes our app is very handy and he would even liked to install our prototype, which could get the latest updates from course pages, on his own smart-phone and become one of our test users.

The interviewee would like easier access to information about the courses as he believes it is not easy to find out things about courses at IFI right now.

The interviewee also mentioned integration with Android calendar for the deadlines and important dates about the desired courses. He mentioned that he would be even happier with warnings on the screen about deadlines and exam dates.

The subject of the weeks lecture is something he would like to see on the warnings.

Downloading course presentations on his device is another feature that he could use a lot.

Video Streaming of lectures on his device was another possible feature for him.

Student 2 :

Nickname : Thomas

Age : 27

Sex : Male

Interview date : 12.03.2011

Duration of interview : 8 minutes

Place of interview : Ole J. Dahl house

Method : Note taking and no recording as we believe recording would make interviewees uncomfortable

Notes from interview :

The interviewee owns a iPhone 4.0 smart-phone which runs IOS.

He is not familiar with concept of programming for mobile devices but he believes it is a very interesting concept.

Thomas believes our app is very useful and he wishes a similar application for iPhone.

The interviewee would like to join courses through his cell phone, or his future iPad.

The necessity of integration with calender on the device and the concept of notification/warning were emphasised by the interviewee several times. He specially would like to have notification on his screen when he receives new updates from courses.

Student 3 :

Nickname : Maria

Age : 24

Sex : Female

Interview date : 14.03.2011

Duration of interview : 5 minutes

Method : Note taking and no recording as we believe recording would make interviewees uncomfortable

Notes from interview :

The interviewee owns a HTC Desire Z smart-phone which runs Android 2.2.

She is familiar with concept of programming for mobile devices and she believes it is a very interesting that someone finally is doing this for IFI students.

Maria believes the integration with calendar on the device and the concept of notification/warning would make her everyday at school much easier.

She complained a lot about the lack of structure in IFI courses which frustrate her every time she wants to choose courses for the coming semester.

She believes also that it is a good idea to know who else is taking the course(if any of her friends is taking that course)

## Appendix II

Email text stored as a picture from web section at USIT to us which granted access to read XML and RSS databases.

Heisann.

For å hente beskjeder fra emner, kan du se XMLen fra emnene slik:

<http://www.uio.no/studier/emner/matnat/ifi/INF3100/v11/beskjeder.xml?vrtx=source>

eller som RSS

<http://www.uio.no/studier/emner/matnat/ifi/INF3100/v11/beskjeder.xml?vrtx=feed>

Tid og sted for undervisning finnes idag i 2 løsninger.

Den ene er per idag kun tilgjengelig som HTML og XML

eks.:

<http://www.uio.no/studier/emner/matnat/ifi/INF3100/v11/tid-og-sted.xml?vrtx=source>

mens den andre har et noe annet format og kalender funksjonalitet:

<http://www.uio.no/studier/emner/uv/pfi/PED2100/v11/tid-og-sted.html>

Det kommer til å skje en del endringer med UiOs Studieinformasjon fremover, og vi kan ikke garantere at disse tjenestene vil fortsette slik videre; og heller ikke garantere for stabiliteten.

Fint om du kan holde oss oppdatert med hvordan denne appen blir, slik at vet hvordan den leser mot nettstedet vårt ( gjerne med å svare på denne eposten).

Lykke til med utviklingen!