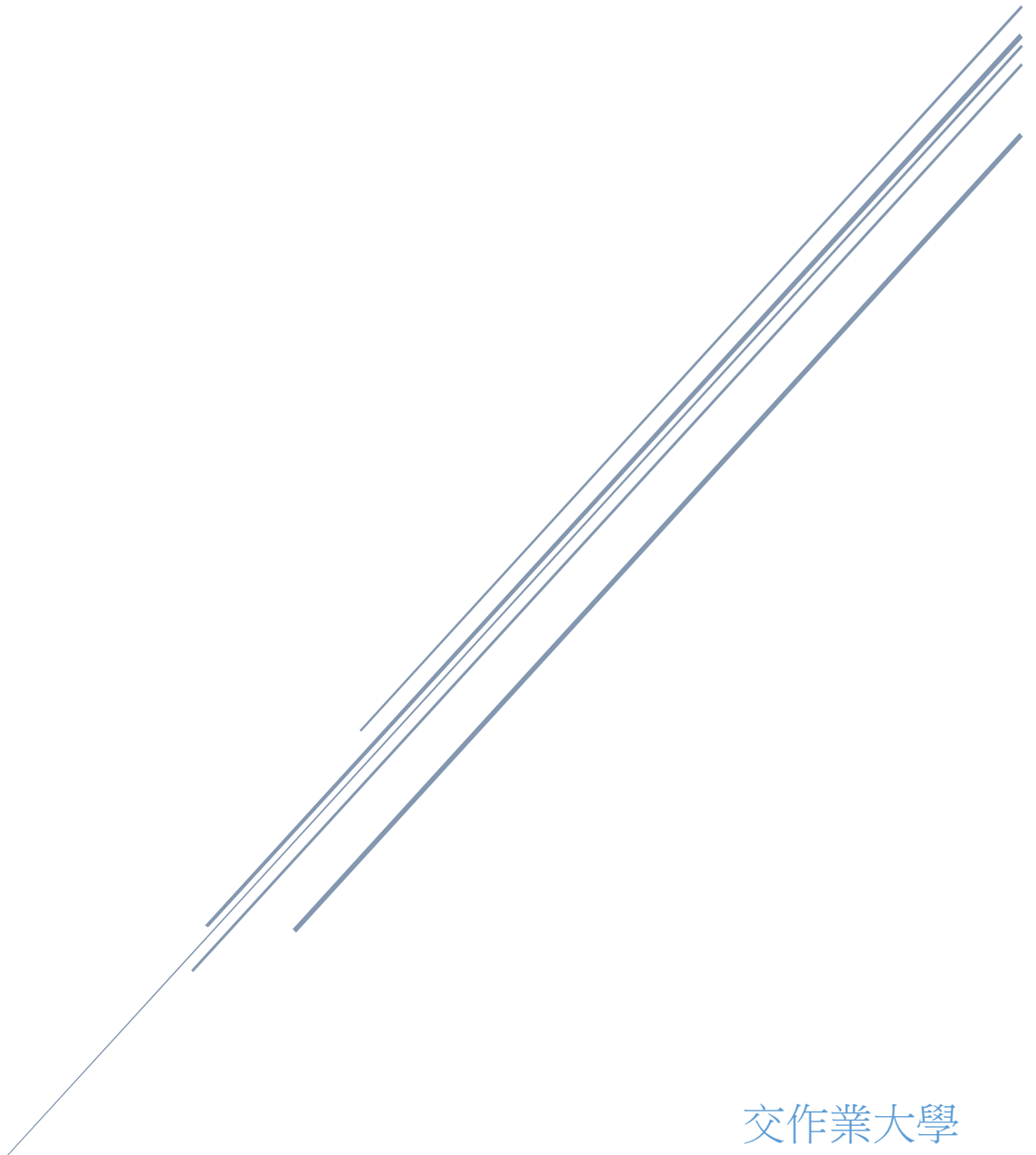



交換學生心得報告

高子勛



交作業大學

第一次交換學生就上手

	I'm Andrew Kao	01
	Sweden	KTH, Royal Institute of Technology
	2012/1/8~2012/6/28	Fall
	I'd like to tell you guys: Why not just finish this article and make your OWN decision!	

Exchange Student Foreword

I chose to be an exchange student at my last semester in my university. Due to this decision, I needed to prepare a lot no matter materially or psychologically; for example, I can neither spend my last semester with my classmate nor attend the graduation ceremony. There are several reasons why I choose Sweden. First, I would like to choose a special country, because most of exchange student chose to go to the United State. Second, although Sweden has their own language, it is still an English-speaking country; therefore, I can still communicate with them even if I do not understand their language. On the other hand, I hope I can train my English-speaking skill, so I can communicate in English more smoothly.

Introduction to Exchange University

KTH, Royal Institute of Technology (Kungliga Tekniska Högskolan), is a university in Stockholm, Sweden. KTH was founded in 1827 as Sweden's first polytechnic and is one of Scandinavia's largest (the largest by certain definitions) institutions of higher education in technology. KTH accounts for one-third of Sweden's technical research and engineering education capacity at university level. KTH offers programs leading to a Master of Architecture, Master of Science in Engineering, Bachelor of Science in Engineering, Bachelor of Science, Master of Science, licentiate or doctoral degree. The university also offers a technical preparatory program for non-scientists and further education.

There are a total of just over 13,000 full-year equivalent undergraduate students, more than 1,500 active postgraduate students and 2,935 full-time-equivalent employees. KTH is one of the leading technical universities in Europe and highly respected worldwide, especially in the domains of technology and natural sciences. The quality of education in KTH is also authenticated. In 2007, by government initiative, the Swedish National Agency for Higher Education employed an international expert committee to find and award the top five highest quality

education areas among all universities and colleges in Sweden. The Royal Institute of Technology received one such "Centre of Excellent Quality in Higher Education". It is the only higher education institution in the Stockholm/Uppsala region to receive an award. In 2009, KTH was the only institution among all Sweden's universities to be awarded "Centre of Excellent Quality in Higher Education". In 2010 the university was ranked 150th in the world by QS World University Rankings, and in 2011 it was ranked 53rd in the world for Engineering & Technology and 99th in the Natural Sciences. In 2010 Times Higher Education World University Rankings ranked KTH 5th in Sweden, 80th in Europe and 193rd in the world.

Course Introduction

BB2480 Energy and Environment

Today, exhaust and pollution of the environment are of high concern to many of us. This involves both the production of products from non-sustainable resources but also the waste that we are continuously accumulating in water, soil and in the air. For treatment of these problems, now and in the future, the efficient use of living cells constitutes an important tool. This course gives you an overview of areas and methods where living cells are used to contribute to the goal of a sustainable environment. This involves the use of biological methods for example in treatment of waste, to enrich compounds from low mineral ore, design and operation of commercial bioprocesses for production of chemicals, biomaterials and biofuels. The course will also treat examples of the negative impact that microbial activity might have, for example in the spoilage of food and beverages and the metal pollution of ground water that is a result of mining processes.

BB2400 Bionanotechnology

Learning outcomes

This course will provide the basic elements of the interface concepts between biology and nanotechnology. The course will focus on the living systems at the nano and micro level as well as the role of genes, proteins and other macromolecules as the building elements of nano structured devices.

After successful completion of the course, the students should be able to:

- Understand the basic concept in cell biology and cell organelles
- Capable to define biological macromolecules
- Understand the basic concept in molecular recognition
- Give an example and explain the function and potential application of protein based structures

- Give an example and explain the function and application of DNA based nanostructures

- Present the result of the laboratory exercise as written report

Course main content

The molecular machinery of the cell, as well as the physico-chemical interactions between the cells characterizes the living systems. Understanding the assembly of the cell opens some exciting possibilities to construct artificial structures in applied nanotechnology, which will mimic the functions of the biological systems.

A major challenge is to exploit the structures and processes of biomolecules at the cellular and organ-specific levels in order to design novel functional materials, biosensors and bioelectronic components.

Lab

Basic sterilization techniques; delivery of molecules/nanoparticles by endocytosis; identification of pathogenic organisms by magnetic nanoparticles-based techniques

BB2530 Micro and Nanotechnologies for Biotechnology

Learning outcomes

The aim of this course is to give a broad introduction to the interdisciplinary field of micro- and nanotechnology and will highlight basic concepts of microfluidics with emphasis on “Lab-on-a-chip” systems for biological applications.

After the course, you will be able to:

- Describe the concept of “Lab-on-a-chip”

- Describe the main microfabrication technologies used to microfabricate microchips and chose the appropriate material and design of micro- and nanostructures for a given biological problem

- Explain potential and limits of microfluidics and suggest strategies to handle challenges.

- Participate in scientific discussions regarding the usefulness of micro-and nanotechnology for a given biological problem.

- Identify possible new application areas for micro-and nanotechnology as well as identify future trends in this field.

Course main content

The course is focused on the use of micro- and nanotechnologies in biotechnology and biomedical research. The lectures will include an introduction to microfluidics and microfabrication technology as well as latest developments in application areas such as nucleic acid and cell manipulation using cutting-edge microfluidic technologies. During the course, an opportunity will be given to take part in

laboratory exercises and one test exam.

Learning in KTH

Inside School:

Generally, schoolwork is learning in school; however, learning attitude exhibited by local students in class is much different from ours. The content taught by professors was almost the same, but Professor often adjusted teaching method through interaction with students. Professor not only adjusted the teaching direction by following the issues raised by the students, and sometimes professors even go deep into profound theories. The professors also attach great importance to the students' point of views. They often divided us into several groups and discussed the issues, then presented the results that we figured out. Sometimes, we even divided the students into two groups to debate about the pros and cons about nano materials.

The contents of project/homework were much different from ours in Taiwan.

Unlike the projects/homework in Taiwan, there were not such complex calculation or a lot of complicated formula; they tried to induct our creativity instead of training our memory; that is, we needed to brainstorm and design some brand new technology that we though it is possible to come into being in following 10 years.

This difference is quite impressive for me.

We are able to found the difference of Swedish education through observing courses and projects. They pay much attention to cultivation of students' innovative ability. In my opinion, innovation is very important for students, so I feel lucky to go to KTH and learn with them.

I hope the domestic education can refer to such teaching methods so that students can cultivate innovative ability.

Outside School:

Europe is very suitable for backpacking. There were many low-cost airlines to European Union countries, so I could go travelling when I was available. Besides, there was a long term holiday (Easter) in this semester, so I could make a longer plan to travel. During Easter holiday, I went 3 countries included Finland, Estonia, and Russia.

During travelling, I had the opportunity to make friends with the locals or other backpackers. We also shared or exchanged our own travel experiences or private attractions with each other. These experiences were quite rare and I thought I would never forget it. I recorded these interesting things of the journey with postcards, such as the local culture characteristics, city landscape, and the state of my mind.

Suggestion

If someone would like to go to Sweden for exchanging, I would give him/her several suggestions. The climate, especially in winter, is really cold, so bringing a warm coat is necessary. Due to high commodity price, comparing the price in different supermarket can help us save more money. Course selection also has some knacks, choosing a course with your friends can help you follow the rate of progress. Making friends is also important, especially for exchange students, because you can learn different cultural characteristics from them and expand the network of people. Last but not least, travelling in Europe is also important for us. Through planning journey, we can train our logic and learn how to range suitable time to sightseeing spot. Hope everyone can enjoy the exchange student life.

Photo



Welcome to Kungliga Tekniska
Högskolan! We can see the logo of
KTH at the first building outside
the subway.



The city hall of Stockholm. One of my favorite sightseeing spot in Sweden!





IKEA would be the first choice if you'd like to buy any necessities in Sweden. Almost everything you can find right here.
P.S Inside the photo is the first friend I made in Stockholm. (Kyo Hun Kang, from Korea)



Albonova, Department of Biotechnology (It took about 20 mins to get here form the exit of subway)



Sometimes KTH hold some activities, such as Ice skating Night. (shoot at Kungsträdgården)



My friends and I went to another university, Uppsala universitet



The largest classroom in Albonova



Famous sightseeing spot: Ice Hotel



The sun rise of Kiruna



Well, we went to Geneva~ XDD

2013/10/18

交通大學
交換學生心得報告

姓名	高子勛	學號	
系級	奈米科學及工程學士學位學程 四年級		
交換期間	自 100 年 1 月 8 日至 100 年 6 月 30 日		
研修學校/前往地點	Royal Institute of Technology, KTH/ Sweden		

心得分為以下幾個部分，我個人認為比起在 Sweden 當地的生活，行前的準備、申請流程還要麻煩許多。

(一) 行前準備：

1. 申請資料：

這部份算是我個人認為需要很大的耐心，由於大部分的學校都需要自行去該校的網站下載申請表格填寫，又由於我三個志願當中有兩個是申請瑞典的學校（網站全部是瑞典文），如果申請上有問題也可以直接 e-mail 到對方學校詢問，通常很快就會回信（除非遇到對方休假），所以有問題的話，可以多多寫信向對方詢問，聯絡方式都可以在”Contact us”中找到。另一方面，交大本身申請規定一定要看清楚，以我的狀況我三個志願中，我申請兩個瑞典學校和北京大學，但後來被學校退件，事後學校才跟我說不得同時申請歐美和大陸的學校。

2. 簽證申請：

瑞典申請簽證速度相當慢，如果跑人工流程大約需要 3 個月的時間，不過由於台灣並沒有瑞典的駐台辦事處（最近的在香港），而且也沒有旅行社幫人代辦，只能從網路上申請，大約需要等 6~8 周的時間，對方才會把 decision（相當於同意書）寄給你，但是這並非正式的 residence permit（重要!!），要拿到正式的簽證，需要等到了瑞典後去當地的移民局拍照、印指紋、簽名後大約 2~3 周才會拿到正式的 residence permit card，而 residence permit card 會直接郵寄到你瑞典的住處，因此去移民局的時候務必要給它們正確的地址，像我本人的 residence permit card 就曾經寄丟，然後又被送回移民局，前前後後花了快一個月才拿到我的 residence permit card。

3. 國際學生證：

依個人狀況決定是否需要申請，也不能拿來當作 ID 使用，通常是購買機票、車票時會有一些優惠，但是拿到學校的學生證之後感覺就比較不常用到，因此不一定要申請。

4. 行李準備：

當時準備行李的時候，我主要考慮當地的天氣 Stockholm 冬天通常會在零下 10~20°C 左右，因此我的行李主要是準備保暖衣物（衛生衣褲、毛衣、羽絨外套...等），至於雪褲我個人認為應該不太需要（有點太厚了），至於吃的部分就只有先帶 4 包泡麵應急而已。

5. TOEFL：

托福基本上想達到 79 分標準是相當容易的，但是一定要多多少少準備一些。我沒有特別去補習，基本上我是買教材自己讀，然後做一些近年的考古題就可以了。（大約準備一個月）

(二) KTH 生活

食：

剛到 Stockholm 的時候，吃的部分主要依賴外食，畢竟剛到一個新的環境，我們甚至還不知道要去哪裡購買食材來煮，因此前面幾天大部分都在外面的餐廳吃飯，瑞典這邊由於人工費用貴、加上課稅...等，價位相當昂貴，因此大部分學生傾向自己煮。

後來環境逐漸熟悉之後，我們就會去超市採購食材，每天去超市購買食材的時候總得去比價或是特價商品，買菜同時也要構思菜單，也真的是來這裡之後才能體會原來在家是多麼好，有爸媽煮飯給自己吃是多麼幸福的事情。之前在家的時候，有時會幫忙爸媽做飯，因此在這裡下廚的時候我並不生疏，並沒有像當初想像，第一次下廚的時候會手忙腳亂的，雖然偶爾還是會有一些小狀況出現（忘記加鹽之類的...）。

來瑞典後才發現其實各地的美食也是和國際學生交流的方式之一，比方說有時我們就會開一個小 party，做一些自己國家常常煮的家常菜，然後邀請自己的同學前來品嚐，除了能認識新的朋友之外，還可以品嚐各國的美食，所以相當有趣！

衣：

Stockholm 今年冬天大約在 0~-10°C 左右徘徊，我的 International Coordinator 說往年 Stockholm 大約已經低於 -15°C，今年算是非常溫暖。因此基本上只要穿兩層衣服，再加上一件厚外套就已經很保暖。基本上帶幾件毛衣、衛生衣褲就 OK，因為這裡的衣服（即使是平價品牌）價格都非常昂貴，因此比較不建議在這裡購買。

除非有某些行程要往更北邊的地方走（such as Kiruna），才需要更厚重的外套（羽絨）或一次穿好幾層外套。

另外，Stockholm 有些地區風比較強，因此也要注意一下頭部的保暖（尤其是耳朵），圍巾也是必備項目之一，有必要時可以當作口罩使用，以個人經驗不太建議戴口罩（尤其是有戴眼鏡的人），因為常會發生起霧到無法看路的情形。

住(Accommodation)：

當初申請 KTH 的時候，對方學校就已經有幫我們安排住宿，因為大部分的學長姐都說住宿是他們自己去找，因此我們算是相當幸運。

我們住的地點離學校大約有 1 小時的車程，在交通上會比較不方便，所以大部分的時間我會寧可去學校圖書館，上課會比較不會那麼趕。

由於宿舍的樓下就有一家超市，但如果不想要自己煮，樓下也有幾家餐廳，所以食的部分我比較不會擔心。房間裡面的設備也不錯，每間都有獨立的衛浴設備、廚房 (有一些基本的鍋具)，一個房間有兩張床、也有棉被、枕頭 (床的部分每間的狀況不一樣)，因此我只需要自行購買床巾、枕頭套即可。

至於室友，我是和一位韓國人 (Nuke) 同房，因此平時宿舍中都是用英文溝通，當初發現室友是韓國人的時候我父母還會擔心會不會很難相處 (畢竟在台灣看過太多韓國一些負面的新聞)，但是其實只要不去在乎那些事情，同學之間的相處其實都很友好，比方說我認識的第一群外國人就是我室友和他的同學們，來這邊的第一天他們就邀我一起去 IKEA 採購一些相關的生活用品。

我們這棟宿舍的風氣比較開放，大部分的人平時都會把門打開，因此只要不要排斥和其他國家來的同學聊天，其實大可敲一下對方的門，向對方自我介紹，不知不覺就會認識很多人，甚至出去玩的時候也會互相邀約。在相處過程中也會發現各國同學的性格差異真的很大，在同一個活動中 (例：Swedish Dinner)，法國的同學就比較文靜；希臘和德國的同學只要拿到 beer 就會開始起鬨！場面相當有趣！

因此除了交通方面比較不方便之外，我個人認為我住的地方 Flemingsberg Centrum 相當不錯。

行：

在 Stockholm 市區交通算是很方便，commuter train、subway、bus 很密集，配合當地的路線查詢網站 (<http://sl.se/en/Visitor/Plan-your-journey/>)，大部分的地方都能輕易到達。

另一方面，建議去 SL center 買一張 access card，有分成好幾種 (依照使用時間長短而價格有所不同)，有了 access card 就可以搭乘大部分的交通工具，除非是要到別的城市才須另行購買車票。

除了火車之外，有時飛機也是交通選項之一，只要上網找一下都可以找到一些很便宜的機票 (有時甚至比火車還便宜)：像是去 Kiruna 的時候大部分的朋友都是搭火車 (20 hr)，但我選擇坐飛機 (3 hr)，而往返的價格大約都是 1000 SEK 左右。

(三) KTH 生活照



來到皇家理工學院 (KTH) 的大門，其標誌就在第一棟大樓上



IKEA 在 Sweden 真的很方便，生活必需品幾乎都在這裡購買
P.S 圖中人是來這邊交到的第一位外國朋友 (Kyo Hun Kang，來自韓國)



Albonova，是生科系上課的地方 (從校門口走到這裡大約需要 20 分鐘)
P.S 圖中的人是帶領我們介紹 Campus Tour 的 Guide



KTH 有時會舉辦一些活動，
如 Ice skating Night，我也是
因為這次的活動讓我喜歡上
溜冰 (圖為 Kungsträdgården)



我和朋友們去 Uppsala (瑞典第四大城) 的 Uppsala universitet 留下的合影



Albonova 中最大的上課教室
P.S 圖中那個背影是我的室友 (Nuke, 來自韓國)



著名景點：Ice Hétel



在 Kiruna 時拍下的日出