

# Teaching Sabbatical – Fall 2017

## National University of Singapore (NUS)

### Department of Mathematics

**Nils-Hassan Quttineh**

Department of Mathematics,  
Linköping University



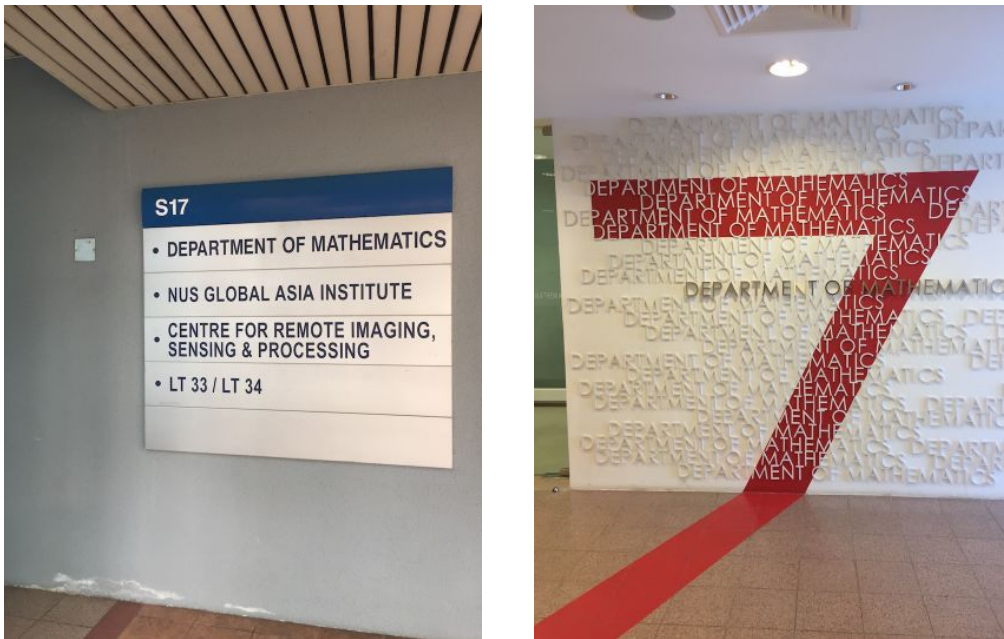
**Figure 1:** NUS – Kent Ridge Campus.

During the fall of 2017, senior lecturer Nils-Hassan Quttineh from the Department of Mathematics at Linköping University (LiU) in Sweden, stayed at the National University of Singapore (NUS) as a visiting fellow, financed by the STINT teaching sabbatical programme.

## 1 Preparation and Planning

*Brief description of how the activities at the foreign institution were planned.*

Once accepted as a STINT fellow, towards the end of the year, it is time to start preparing for the upcoming adventure. Together with the acceptance note from STINT, you will also find out where you will be going, and you will be provided both an academic contact as well as an administrative contact at the foreign university.



**Figure 2:** The Department of Mathematics is located in building S17, floors 4–8, and my office was located on the 7th floor.

### Visiting week

As part of the teaching sabbatical, you are supposed to do a visiting week at the appointed university. The intension of this week is for you to meet the department where you'll be working, and to have the possibility to discuss what kind of teaching duties you will have during your stay.

My visiting week was held in March 2017, and I met with my academic contact Ka Hin Leung to discuss my teaching duties in the fall. After some discussions and looking into possible courses (or moduels), we agreed on which course I was going to teach and I got material from previous year's examiner (Prof. GongYun Zhao).

I also met with my administrative contact, Ms. Lynette Wong, to discuss the upcoming paperwork to be done, and to prepare the application for a working visa for the fall. Ms. Wong also helped me to arrange a visit to the residential area Kent Vale, an on-campus apartment area organized by NUS, where I agreed on a service apartment for my stay during the fall.

## Paperwork

Throughout the months preceding my departure to Singapore, there were several forms and applications that had to be filled in and processed. Luckily, my administrative contact Lynette Wong had it all under control and helped me out.

- **Personal Particulars Form**

This is the NUS employment papers, which was straightforward to complete. A short CV was also requested, and a copy of my passport.

- **Employment Pass Application Form**

This is the application form for the working visa, and it was more cumbersome to complete. It requires details regarding your employer (Linköping University in my case), as well as information about your current employment (salary, position etc.). In the end, when I had completed the form, the application was submitted by NUS to the Ministry of Manpower.

In general, I would recommend future STINT fellows to complete and send back any forms your administrative contact send to you as soon as possible, since all the bureaucratic processes take several weeks. (In the end, one month before traveling to Singapore, I was still waiting for an official decision on my working pass.)

## 2 Tasks and responsibility

*Description of my position and work responsibilities at the foreign institution.*

When meeting with my academic contact during the visiting week, it was decided I was going to be examiner for the course MA3236 – Nonlinear Programming, an optimization course given for the third year students at NUS. Work duties included giving lectures and tutorials, preparing tests and assignments, as well as constructing the final exam. In short, I was responsible for the whole course.

The teaching was carried out by me individually, however, the previous examiner was available for consultation throughout the semester. I was provided good course material from the previous year, but was encouraged to extend certain parts of the lecture notes and to develop some new course content. I didn't want to make any big changes, it seemed reasonable to keep the course similar to previous years. Although, since the module isn't prerequisite or mandatory for other courses, it is my feeling that I actually could have diverged quite a lot without anyone protesting.

My official title at NUS, at the Department of Mathematics, was "Senior Visiting Fellow" and I was presented on their webpage as "Visiting Staff". Basically, I was treated as regular staff and was expected to take care of all matters regarding the module, and to respond to queries regarding the module from students.

### 3 Activities during the semester

*Summary of the main activities carried out at the foreign institution.*

Each course, or module, given at NUS has a five-digit legend describing the weekly workload. For my module, MA3236, the code was 3–1–0–0–6, which reads 3 hours of lecture, 1 hour of tutorial, no laboratory work, no projects, and 6 hours of preparatory work. Further, the schedule for lectures and tutorials in each module is fixed; I had lectures 4–6 pm every Tuesday and Friday, and tutorials 12–13 pm on Thursdays and Fridays.

It should be mentioned that modules at NUS are scheduled over 14 weeks, excluding the reading week and the exam period itself, stretching over the whole semester. For a 4 credit course, this implies a very slow pace and progression in the course, something that I am not used to. (Back home, 4–6 credit courses are usually done within half a semester.)

#### Lectures and Tutorials

There were 45 registered students on the module, which according to the previous examiner was quite normal. There were around 7 exchange students in my class, and quite surprisingly four of them from Sweden! The lecture hall was a larger class room, big enough to fit all students, while two tutorial groups were available for the students to choose from (one on Thursdays, and one on Fridays). About 60% of the students participated regularly at lectures, and only about 25% attended the tutorials on a regular basis.



**Figure 3:** Left: From a tutorial session. Right: From the computer exercise.

As part of the continuous assessment, students had to solve two sets of assignment questions and partake in a midterm test. All these activities generated a lot of work for me; grading the assignments and the midterm test was very time consuming.

Further, I also introduced a mandatory computer exercise to the module. This exercise replaced the lectures during one week, and based on the outcome of the course evaluation, it was received positively among the students.

## IVLE

The Integrated Virtual Learning Environment (IVLE) is a NUS' custom designed and built Learning Management System for the NUS community. It is designed to facilitate and supplement teaching at the National University of Singapore (NUS).

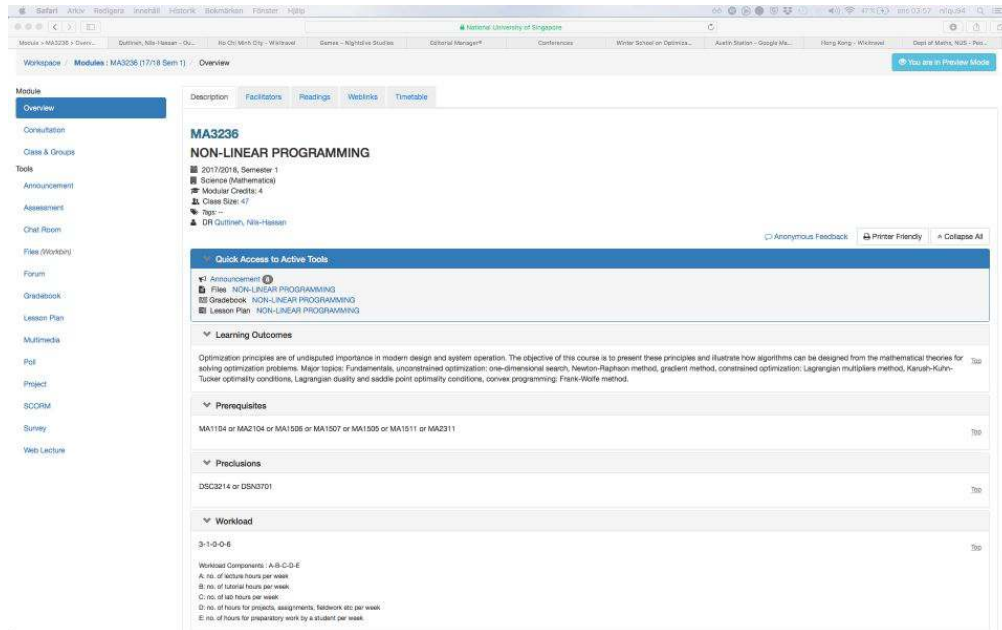


Figure 4: The IVLE system.

It is mandatory for modules to be available in the IVLE system, and I found it extremely user-friendly and intuitive. Through this system, it is possible to communicate with the course participants, send them messages, and to share lecture notes and other material. It is also possible to create a “Gradebook”, a score sheet, where results from assignments and the midterm test can be recorded. This is helpful for the students as they have a good overview of their progression.

At the end of the course, it was also very easy to transfer the gradebook records into the grading system (IMMS).

## Other activities

Although I was given course material from previous year, such as lecture notes and tutorial exercises, I really had to spend most of my working hours preparing lecture slides (which did not exist) and to learn all the details of the lecture notes in order to present them in a convincing manner (the devil is in the details). It also took me some time to get a good overview of all the tutorial exercises, and to prepare solutions for them, as well as constructing the continuous assessment exercises (assignments, midterm, computer lab).

At times, I managed to sit in and listen to lectures in another optimization module.

## 4 Important lessons

*What knowledge of importance for my role as teacher/researcher have I gained during my time as a STINT-fellow?*

Spending time away from one's home environment allows for reflection and to see things in a new light. Here are a few points of wisdom I gathered during my stay.

- The course I was teaching, Nonlinear Programming, contained material I had good knowledge about, and I got good course material from the previous year. Even so, it required a great effort on my part to prepare the lectures; partly because some of the course content was actually new to me, to learn new stuff takes time, and partly because I had never *taught* some of the material before.

I have realized what an amazing difference it is to teach something for the first time, although the knowledge itself is not new. Small things, like being able to give appropriate examples to clarify something, which is easy when you can foresee which parts that are considered tricky by the students.

This is perhaps obvious, you don't have to go abroad to realize this, but it became very clear for me during this time when teaching was my main focus.

- I have a better understanding of cultural differences in teaching, how knowledge is perceived, something which affects the way of teaching greatly. In Sweden, here at LiU, I am very confident in the way I teach. Students seem to appreciate my teaching style and I usually get very good course evaluations. This very same teaching style did not work out as well in Singapore.

As an example of difference in teaching style, and perception of what is good knowledge, me and my colleagues at LiU often focus on deep understanding of mathematical concepts by graphical interpretation. Simply put, we like to draw a lot. This was a new experience for most asian students in my class, and some of them explicitly told me how they prefer to do algebraic calculations. In my experience, students can learn how to solve quite complicated mathematical problems, by doing calculations, but actually not understand what is going on.

This gained awareness will certainly be helpful for me in the future. Currently, I am teaching a course for Master students every fall, and there are non-european participants from time to time. Hopefully I am now able to approach them differently, or rather keep in mind what they are used to and motivate the use of illustrations more clearly. It will also help me in my role as PhD supervisor; I am currently co-supervising a non-european PhD student, and it is likely, in this era of globalization, that future PhD students will also have a different cultural background.

- It becomes abundantly clear how much time and energy that is spent on meetings in one's home environment. When on a teaching sabbatical, all other duties and meetings are stripped away, and it is a bless. I will definitely try to minimize the bad effects of meetings, since meetings are of course necessary, but for example I nowadays get much more annoyed when people get off-topic and hence decreases the efficiency of a meeting.

## 5 Comparison between NUS and LiU

The two universities NUS and LiU are comparable in size when it comes to the number of students, but NUS is much bigger when looking at research.

Numbers for AY 2017	NUS	LiU
No. Campuses	3	3
No. students	38 000	27 000
No. PhD-students	?	700
No. Dissertations 2017	700	100
No. employees	11 000	4 000
- Faculty	2 400	?
- Research Staff	3 500	?
- General Staff	2 300	?

A question mark is used for entries in the table where I was not able to find the specific information. It is worth pointing out that the total number of employees at LiU is approximately the same as the number of research staff alone at NUS.

### Research & Teaching

The universities in Singapore seem to have extremely good fundings. At NUS, at least at the Department of Mathematics, any professor or lecturer on tenure track get to teach one course each semester, that's it. The rest of the time is yours to do research! Even so, my impression is that teaching was taken seriously.

The working conditions at Swedish universities, with respect to the balance between research and teaching, are quite different. These conditions obviously vary somewhat between universities and on an individual level, but the reality for most of us is a heavy teaching load. At least that is the default state; if you are able to get research funding yourself, you get to do research, otherwise you teach.

### Students

In accordance with the general perception of asian students, I expected disciplined and hard working students. And in many ways, that's what I got. Students were very respectful and always addressed teachers as "Prof". For the tutorial sessions, students were well prepared and had done almost all the exercises. (I did expect some students to show up in my office and ask questions in between classes, but this did not happen even once throughout the whole semester.)

One big difference between students at NUS and LiU, in my limited experience, is that NUS students take great responsibility for their studies; they come well prepared to the lectures and the tutorials, something which is rare among Swedish students. During lectures and tutorials, though, when posing a question to the class I found it difficult to get any interaction going on. In this aspects, Swedish students are more responsive and active. This is of course a cultural difference, different teaching styles, and the NUS students cannot be blamed for this.

## Teaching and administration

Although very formal in general, I found the relationship and interaction between faculty members quite relaxed. But the formal tone was in general kept between the “academic” staff and the administrative staff.

Both the administrative staff and the IT support staff were very helpful and efficient. Most of the interaction with the administrative staff, with respect to my teaching, took part in the beginning and at the end of the course. Most of the course administration was conducted using IVLE, but certain practical details had to be sorted by the administrative staff. An example would be to get a pigeonhole box assigned for the module, to be used for students to hand in their continuous assignments. Also, towards the end of the course, each examiner has to make an appointment with an appointed administrative staff to make copies of the final exam.



**Figure 5:** Pigeonhole boxes.

A clear difference from Sweden is how the administrative staff actually had mainly administrative duties and took care of practical details that an examiner otherwise would have to deal with. It is my feeling that pure administrative work is sometimes regarded as “not nice enough” by the administrative staff themselves in Sweden.

## Curriculum and courses

NUS offers a wide variety of courses, and I was impressed by the vast number of modules offered by the Department of Mathematics. Besides the standard introductory courses in linear algebra and calculus, which are almost the same everywhere, many advanced courses within different fields of mathematics are given every year.

A major difference from Sweden is how courses are organized over a semester. In Sweden, each semester is divided into two periods, and students usually take two or three courses each period. Instead, at NUS, students take about five or six courses in parallel each semester, and the courses stretch over the whole semester.

Other differences is the common use of continuous assessments, such as hand-in assignments and midterm tests. This is done in some courses in Sweden, of course, but it is not as common (in my experience), at least not within mathematics. The final exam still accounts for the majority of the final grade, similar to our courses.

## Use of technology

During the semester, I sat in on a few lectures in other mathematics modules, and from what I saw the lectures were very similar to lectures in mathematics back home. Some teachers use whiteboard only, others use PPT/Beamer presentations in combination with examples on the whiteboard.



## 6 Action plan - topics to address

The objective of STINT's Teaching Sabbatical programme is to develop both individuals and institutions. Here is what I hope to bring back, and possibly change, in my everyday life at LiU and the Department of Mathematics.

- On a personal level, I will try to introduce (or increase) the use of continuous assessment in my courses. Although quite time consuming, if not done in a smart way, it is a good way to motivate students to keep up as the course progresses and to some extent decrease the heavy load from the final exam.
- On a departmental level, I will give a presentation about my time in Singapore at NUS, to share my experiences from teaching at a foreign institution. The main objective will be to encourage colleagues, advise them to spend some time away from the department in order to see that things can be done in different ways. (The way it is currently done is not necessarily the best way.)

Further, the idea of co-teaching is interesting, and seems to be unanimously recommended by previous Stintonians who had the possibility to try it during their teaching sabbatical. Since I didn't get that chance during my stay at NUS, maybe I could convince a colleague to try this with me at LiU.

The module legend which describes the weekly workload is excellent! Students nowadays seem to have a hard time working and making an effort into off-schedule studying. Maybe this could help them get organized?

- At an institutional level, my best course of action in order to actually affect something is to share my experiences of using the IVLE system with the LiU IT department. This department is currently developing the equivalent of IVLE, and some parts of this system definitely offers room for improvement.
- On a national level, I would like to promote the idea of introducing the sabbatical term in the Swedish academic system. This internationally well known system allowing a university researcher or teacher to take a sabbatical term after some specified amount of years is an excellent way of keeping academics motivated as it allows both for concentrated work on a research question as well as for personal reflections. It is obviously a costly system, but the gains are manifold. To spend time elsewhere, to meet like-minded people, without the distractions of department politics or duties within one's university, is bound to result in great outcomes.

## 7 Conclusions

My advice to anyone considering a sabbatical, you should definitely do it! It is an excellent experience, one that not many people get the chance to do.

One of the best parts of staying at a housing facility such as Kent Vale, at least for me, was to meet other people that were also on a sabbatical. This is where I got the most social interaction, by far. I met fellow Swedes, several Americans, a couple from Britain, an Italian, a Canadian, and so on.