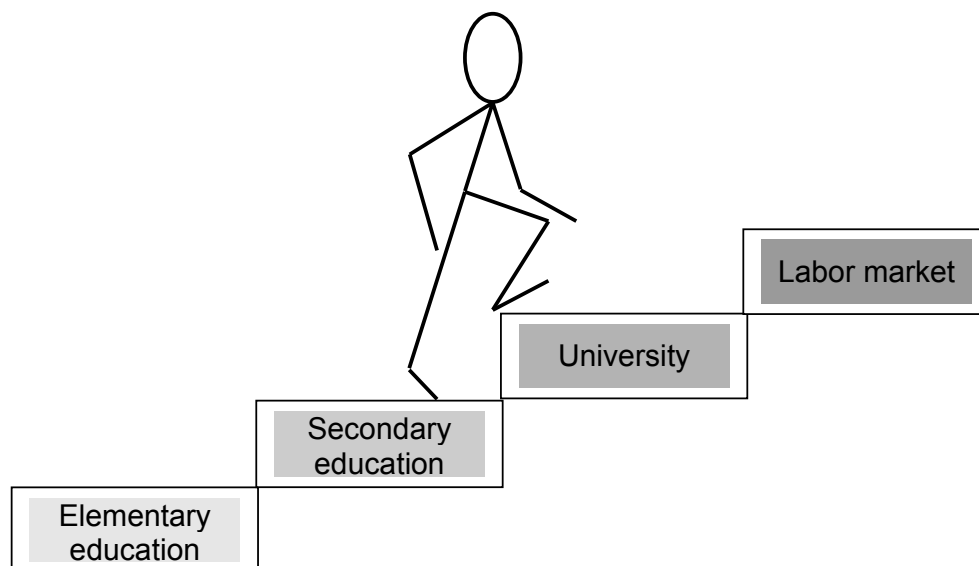




The agro-economic education at St Cyril and Methodius University in the republic of Macedonia

- a comparative study of the agro-economic university education in Macedonia, Sweden, Norway and Greece



Summary

This report is a part of a larger SIDA-project that is trying to improve the Macedonian capacity for policy formulation and for performing economic analyses related to the agricultural sector. A key area in this project is the education in the agricultural sector and that is where this report comes in, by providing the background material for a meeting between teachers at the Swedish University of Agricultural Sciences (SLU) and St Cyril and Methodius University in Macedonia (St CMU). During this meeting the agro-economic education at St CMU will be discussed. The purpose of this report is therefore to give the Swedish teachers insight in the agro-economic education given at St CMU in order to assist the university in the development of the curriculum. This will be done as a comparative study between St CMU and SLU, but also with the Agricultural University of Norway (NLH) and Aristotle University in Greece (AU). Teachers in different academic fields at SLU have been consulted to give their opinions about the Macedonian courses. The focuses of the comparison are 1) the educational system, 2) the curricula's standardization, 3) the curricula's disposition, 4) the content and level of the courses and finally 5) the methods for learning.

The educational system in Macedonia, Sweden, Norway and Greece are about the same when it comes to the requirements for previous years of studies of elementary and secondary educations. However, concerning the university education the four studied universities differ. For example St CMU and AU demand two more years of study for a "Master of Science" graduation than SLU and NLH do.

Regarding **the curricula's standardization** the lowest degree of student choice is at St CMU and AU ones compared to the other universities. The "Economics and Administration" program at NLH is also quite standardized. SLU and the "Economics and Resource Management" program at NLH differs from the others and produce the least standardized students.

Concerning **the curricula's disposition** all universities in the study offer their students about the same amount of credits in economic subjects. What differs is that St CMU and AU offer 60-100 credits more in non-economic subjects than the other universities do, which gives them a broader base in their education.

Regarding **the level of the courses** all courses in mathematics and statistics hold a basic level of knowledge and the ones in economics and business administration reach the advanced level. Many of the courses at St CMU's master program are descriptive and seem to have a low level of knowledge compared to the ones at SLU. When it comes to **the content of the courses** in economics and business administration, St CMU focuses more on the agricultural business and additionally lacks the connection between economic subjects and environmental aspects compared to SLU.

When it comes to **the methods for learning**, SLU has most computer practices in their courses compared to the other universities. SLU and NLH provide computers for the students to use on a daily basis, in opposition to St CMU. St CMU also differs from SLU and NLH in that they seldom give the students written exams or assignments and they do not incorporate elements of critical and analytical thinking as part of the education.

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1 Introduction

This report is a part of a larger SIDA-project that is trying to improve the Macedonian capacity for policy formulation and for performing economic analyses related to the agricultural sector (SLU 2004). Macedonia shall, through Swedish cooperation, build up its own capacity to formulate efficient policies and undertake strategic economic analysis of food sector issues. A key area where such knowledge and skills may be required is in the education in the agricultural sector. This is where this report comes in, by providing the background material for a meeting between teachers at the Swedish University of Agricultural Sciences (SLU) and St Cyril and Methodius University in Macedonia (St CMU). During this meeting the agro-economic education at St CMU will be discussed.

1.1 An equivalent university education in Europe

To have an equivalent university education in the European countries has several advantages in that both students and teachers more easily can move across the country borders (ESIB 2004a, Internet: Swedish Ministry of Education and Science 2004b). A student that changes university from one country to another can still keep up with the studies if the curricula are comparable. A graduated student will also be able to take on an employment in another country with less difficulty, since the employer know what to expect from the student's education. A more equivalent level of universities also means that the information exchange flows more easily, which helps the European universities to stay up to date with the latest research.

A more equivalent higher education has great advantages, but is also concerned with some problems. If the vision is on Europe as a whole, the expense will be the loss of focus on the individual countries. European countries have proven to be very different concerning political and social issues, which propose a problem in making the educational system too similar. The labor market in different European countries does not request the same knowledge and skills of graduated students. Since one of the main purposes of university studies is to get a job, it is pointless to educate students that the labor market does not want. Of course, some of the students can find work at labor markets in other countries, but not everyone is willing to move abroad. Additionally, not all will be able to get work in other countries since they have to compete with natives, which have an advantage in knowing the culture and the language. The conclusion is therefore that during the process of making the educational system more alike within Europe, we also have to focus on what the different countries need from the system. This is something that the Bologna Declaration does by trying to achieve a more equivalent higher education within reasonable limits.

1.1.1 The Bologna Declaration

In 1999 the Bologna Declaration was signed by 29 countries in Europe as a promise of future cooperation (Internet: Swedish Ministry of Education and Science 2004a). The overall aim was to build the European Higher Education Area until the year 2010.

This would increase students' mobility between universities and labor markets within Europe. The countries that signed the declaration wanted the educational system to be more clear and comparable between European countries. The three major aims of the Bologna Declaration are (Internet: ESIB 2004a):

1. Mobility of students, teachers, researchers and administrative staff
2. Employability
3. International competitiveness and attractiveness

These aims are specified in six more operative objectives (Swedish Ministry of Education and Science 2003, Internet: ESIB 2004b). **The first** one is the implementation of easily readable and comparable degrees. **The second** is the adoption of a system essentially based on two main cycles: undergraduate and graduate levels in all countries, with a third cycle for the research education. The first cycle should be no shorter than three years and result in a degree that is clearly relevant to the labor market. Access to the second cycle requires the successful completion of the first cycle. It should lead to a master degree and possibly later to the third cycle and a doctoral degree. **The third** operative objective with the Bologna Declaration is the establishment of a comparable system of credits. Such a system is the European Credit Transfer System (ECTS)¹, which helps promoting the most widespread student mobility. **The fourth** objective is the improvement of the free movement of students and teachers through structural reforms by taking away obstacles. **The fifth** objective is an increased European cooperation concerning quality assurance through the development of comparable criteria and methodologies. **The sixth** and last objective is to develop "the European dimension" within higher education, especially concerning the development of the cooperation between universities and the contents in courses.

The Bologna Declaration has been followed up in Prague 2001 and Berlin 2003, where amongst others the importance of life long learning has been discussed (Internet: Swedish Ministry of Education and Science 2004b). The next meeting will be in Bergen 2005. At this moment as many as 40 countries have signed the Bologna Declaration, of whom Sweden and Macedonia are two.

1.2 Problem

At the approaching meeting between teachers from St CMU and SLU the Macedonian agro-economic education will be discussed. To be able to have a fruitful discussion the Swedish teachers have to be well versed and aware of the agro-economic education at St CMU. The main problem, however, is that the Swedes lack information about the Macedonian education. Since the educational systems at the two universities are so different it is difficult for the Swedish teachers to get a clear picture of the Macedonian curriculum and syllabi.

¹ A comparable credit system that now is used in many countries is the European Credit Transfer System (ECTS). ECTS credits reflect the quantity of work each course requires in relation to the total quantity of work required to complete a full year of academic study at the institution. In ECTS, 60 credits represent one year of study; normally 30 credits are given for six months and 20 credits for a trimester. (SLU 2003a)

1.3 Objective

The purpose of this report is to give insight in the agro-economic education given at St CMU in Skopje, Macedonia, in order to assist the university in the development of the curriculum. This will be done as a comparative study with foremost SLU in Uppsala, but also with the Agricultural University of Norway in Ås (NLH) and Aristotle University in Thessaloniki in Greece (AU). The focuses of the comparison will be:

1. The educational system (see chapter 2)
2. The curricula's standardization (see part 3.1)
3. The curricula's disposition (see part 3.2)
4. The content and level of the courses (see part 3.3)
5. The methods for learning (see part 3.4).

This report constitutes the background material needed for the meeting between teachers at SLU and St CMU where the Macedonian education will be discussed.

1.4 Methods and delimitations

This report will focus on the education to become a "Master of Science" in agro-economics at St CMU in Macedonia. It is essentially a comparative study of the agro-economic bachelor and master program at St CMU with the corresponding program at SLU in Sweden. At present, the Swedish program is being reformed and as a consequence the comparison is done with current curriculum. Other comparisons on a more basic level have additionally been made with the AU in Greece and with NLH in Norway. Since NLH has three different educational programs to become a "Master of Science", only the two most common have been considered in the comparison. These programs are "Economics and Resource Management" and "Economics and Administration".

1.4.1 Necessary translations

The curricula for the bachelor and master programs and the syllabi for the courses have been the main source of information. The curriculum and syllabi at St CMU have been translated into Swedish and thereafter compared with the ones at SLU. The curriculum and syllabi at NLH have not been translated at all, since the language is very similar to Swedish. Finally the curriculum and syllabi at AU has been translated to English. Summaries of the curricula have been made and can be found in appendices 1-4.

To be able to compare courses from different countries with different credit systems, the course credits have been translated to the European Credit Transfer System (ECTS). ECTS is a comparable credit system that is used in more than 1 200 institutions in Europe (SLU 2003a). It reflects the quantity of work each course requires in relation to the total quantity of work required to complete a full year of academic study. In ECTS, 60 credits represent one year of study; normally 30 credits are given for six months of studies and 20 credits are given for a trimester. In three cases it has been difficult to translate the quantity of work to the ECTS.

1. The first of these cases concerns the individual practice at SLU, which usually do not carry any credits. To make the educations more comparable the workload has been translated to the ECTS, where the practice of 16 weeks corresponds to 24 credits. However, the individual practice will probably be removed as part of the ongoing reform of the curriculum.
2. The second case concerns the master program at AU, where the university does not seem to give any credits for the master courses. Therefore, the system of giving credits has been adopted from another Greek university, the Mediterranean Agronomic Institute of Chania (Internet: MAICH 2004). This university gives 60 credits for the master thesis and 60 credits for the courses, which approximately means 3.75 credits per course ($60 \text{ credits} / 16 \text{ courses} = 3.75$). Since these are two universities in the same country that both have agro-economic master programs, our expectation is that this credit system can be applied for both universities.
3. The third case where it has been difficult to translate the quantity of work to ECTS-credits concerns the master courses at St CMU. Just like at AU these courses are not carrying any credits. In the future, however, they will be given 90 credits totally, which approximately means 11.25 credits per course ($90 \text{ credits} / 8 \text{ courses} = 11.25$).

1.4.2 Course of action

First of all a short survey has been done of the four countries **educational systems**. The survey has focused on the time perspective, where the amount of years in elementary, secondary and university educations has been compared.

After the survey the curricula have been compared between the four universities concerning its standardization and disposition. To measure **the curricula's standardization** the amount of credits in compulsory courses, elective courses and individual specialization, like the thesis and the period of practical training, have been used. To compare **the curricula's disposition** the courses have been categorized according to their contents, with the help of teachers at SLU in the academic fields in question. First the courses have been divided into one of two groups: courses in "economic subjects" and courses in "non-economic subjects". The courses in economic subjects have then been categorized in economics or in business administration. The courses in non-economic subjects have been categorized in mathematics, statistics, biology, technology etc, according to their main contents. The comparison has only focused on two non-economic subjects, mathematics and statistics. Therefore, the categorization of the courses in non-economic subjects has not involved teachers in the academic fields in question.

After the curricula have been compared the report has focused on the courses in St CMU's syllabi. The syllabi have been evaluated concerning the courses contents and levels and the methods for learning. To evaluate **the content of the courses** Swedish teachers in each academic field have been consulted to obtain their professional opinions. The teachers have only focused on the courses in mathematics, statistics, economics and business administration given at St CMU and SLU. The courses at NLH and AU have not been considered at all. To compare **the level of the courses a**

scale with three grades has been used. The scale has been suggested by the Department of Education at SLU and it consists of (SLU 2003a):

1. Basic level courses: introductory courses that usually comprise studies up to one term (30 ECTS).
2. Intermediate level courses: build upon the basic level courses and usually comprise up to one term of studies (30 ECTS).
3. Advanced level courses: usually have specific course requirements of studies at the basic level and intermediate level in the same subject.

To evaluate **the methods for learning** the report has focused on written assignments, computer practices and critical thinking. Three of the universities have been concerned: St CMU, SLU and NLH. AU has not been included in the comparison because of the lack of information.

Figure 1 below gives a short summary of the course of action with the basic survey and the comparisons of the universities curricula and syllabi.

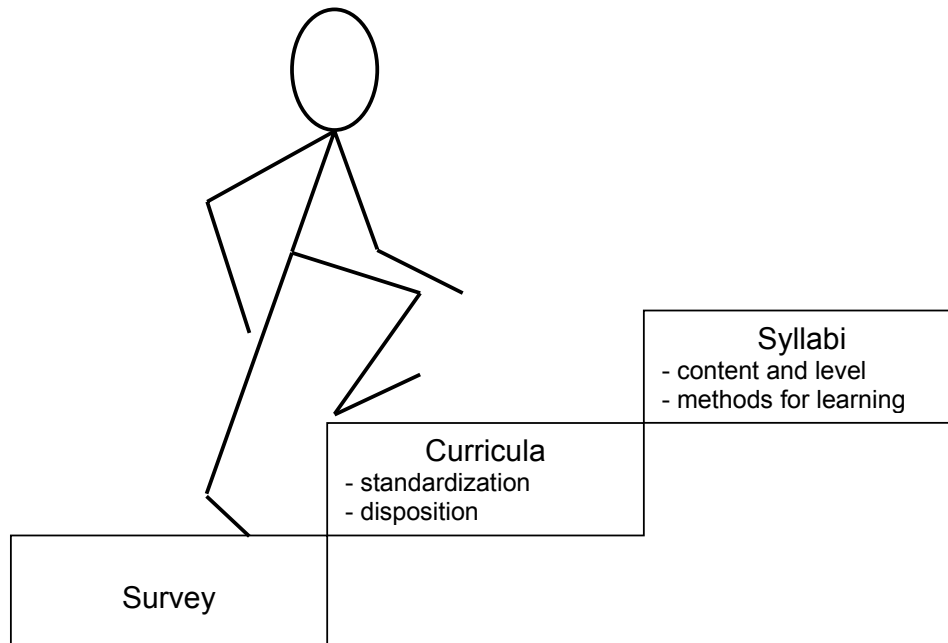


Figure 1. This figure illustrates the course of action for the production of this report.

There are often difficulties concerning a used method. The specific difficulties during the work with this report are discussed in the section below, as well as the attempts to reduce these problems.

1.4.2 Difficulties concerning the method

A main problem during the work with this report is the translation of the curricula and syllabi, which could be a significant source of error. To reduce the impact of this problem an authorized translator has translated the curriculum and syllabi of St CMU. According to this translator the language was unnecessary detailed and complicated.

Even though a translator has been used, the translation problem concerning the Macedonian information still exists, as well as for the Swedish, Norwegian and Greek information.

Another main problem has been the lack of information. The curriculum and syllabi at St CMU is constantly improving, which indicates that all new information may not reach SLU during the composition of this report. Whenever there has been a case of missing information, estimations have been made in order to reflect the reality.

Another problem, concerning the lack of information that is of great importance, is the difficulty in deciding from the syllabi what the true content and level of the courses are. It is very likely that information is missing and that the students at the university in question learn more than there is to read in the syllabi. To reduce this problem teachers of each academic field have been consulted to give their professional opinion in the matter. Since the teachers are well versed they can give their general judgment by looking at the course description and the course literature. Even though this has been done, it has to be stated that all the conclusions about the education and the courses are based on the syllabi.

During the categorization of the courses there has also been a risk of misconceptions. Since SLU and NLH already have categorized the courses that they give, this risk is only relevant for the courses at St CMU and AU. To reduce this risk of misconceptions the categorization has been discussed with teachers in the academic fields at SLU. However, this has not been done for the courses in non-economic subjects, except for the courses in mathematics and statistics. The reason is that the other courses in non-economic related subjects are not included in the comparison.

2 The educational system

This chapter gives a short insight in the educational system in Macedonia, Sweden, Norway and Greece. The previous schoolings in the four countries are compared and so are also the university educations for agro-economic studies at St CMU in Macedonia, SLU in Sweden, NLH in Norway and AU in Greece. The comparison is focused on the educations' length of time and is summarized in table 1 below.

2.1 Elementary and secondary education

The elementary education in Macedonia is very similar to the ones in Sweden, Norway and Greece (Gjosevski and Milanov 2004, Karlsson et al. 2004). Students start school when they are six or seven years old. In Macedonia the elementary education lasts for eight years, which is for a shorter period compared to the other countries. However, Macedonia compensates for this by having the students in secondary school for a year longer than the others. This means that Macedonia has about the same requirements for previous years of studies, when students apply for university, as Sweden, Norway and Greece do. In table 1 below there is a survey of the educational system where the previous education before university can be seen.

2.2 University education

The university education differs between the countries when it comes to graduation-titles and years of studies for those titles. According to the Bologna Declaration the aim should be a system essentially based on two main cycles excluding doctoral studies (Internet: ESIB 2004b). The studied countries all practice a similar system with two main cycles: an undergraduate and a postgraduate level (see table 1). Norway also combines this with a graduate level between the other two; hence, it has three cycles recommended by the Bologna Declaration. This report is focused on the education to become a "Master of Science", which is held at the postgraduate level at St CMU in Macedonia and AU in Greece, at the graduate level at NLH in Norway and at the undergraduate level at SLU in Sweden. The years of study to become a "Master of Science" differs between the universities. At St CMU and AU it takes about seven years, at NLH five years and at SLU only four and a half year. This can also be seen in table 1, where the "Master of Science" programs are highlighted. According to the Bologna Declaration, five years is to strive for and during the production of this report SLU is thinking about extending the education. A main difference that is worth noting is that the master students do not need to first graduate as bachelors at SLU and NLH, which they do at St CMU and AU.

It is not only the amount of years to finish the university studies that is of importance, but also the intensity of studies during these years. The study year at St CMU, SLU and AU consists of two semesters (pers. comm. Dimitrievski 2004, SLU 2003b, Internet: AU 2004f). The autumn semester starts in September or October and ends in January or February. The spring semester, on the other hand, begins in February and ends in May. NLH differs from the other universities, since the autumn semester starts in the beginning of August and ends in the middle of December (NLH 2003). The

spring semester starts in the beginning of January and ends in late June. This means that the study year is longer for the students at NLH than for the students at the other universities.

Table 1: Survey of the educational system at St CMU, SLU, NLH and AU (Compiled from data in Gjosevski and Milanov 2004, Karlsson et al. 2004, SLU 2003a, Internet: NLH 2004a, Internet: UFD 2004, Swedish Ministry of Education and Science 2003, 67ff, Internet: Ministry of National Education and Religious Affairs 2004, Internet: AU 2004a)

	St CMU	SLU	NLH	AU
Pre-university	Elementary education 8 years	Elementary education 9 years	Elementary education 10 years	Elementary education 9 years
	Secondary education 4 years	Secondary education 3 years	Secondary education 3 years	Secondary education 3 years
Undergraduate	Agricultural Engineer 5 years	Bachelor of Science 3 years	Bachelor of Science 3 years	Bachelor of Science 5 years
		Master of Science 4,5 years		
Graduate			Master of Science 2 years	
	Specialist Degree 1 years			
Postgraduate	Master of Science 2 years			Master of Science 1½-3 years
	Doctoral degree 4-5 years	Doctoral degree 4 years	Doctoral degree 3 years	Doctoral degree 3-5 years

3 The agro-economic university education

This chapter concerns the comparison of the curricula and syllabi of St CMU (St CMU 2003), SLU (SLU 2003b), NLH (NLH 2003, Internet: NLH 2004b,c,d) and AU (AU 2000, Internet: AU 2004b,c,d,e). The chapter starts with a comparison of the educations level of standardization. Then the focus is set on the disposition of the curricula and the content and level of the courses. As a final issue the methods for learning are compared and discussed.

3.1 The curricula's standardization

If a curriculum is standardized the students have no freedom to choose among courses. This means that the students are not able to affect and individualize their education. A highly standardized curriculum will lead to a high standardization of graduated students, which has both its advantages and disadvantages. For a small university it is easier and more profitable to standardize the education and only teach "one" course at the time. This saves money since the number of students in each class can be held high which gives scale advantages. Additionally, the employers know exactly what to expect from the newly graduated students. This means that the students do not need to market themselves and their individual skills to the extension that "un-standardized students" do. A disadvantage of a high standardization among graduated students is that they all have to compete for the same jobs. If the students could specialize in different areas they would fit better into the labor market and all together take on a wider range of employments. Another disadvantage can be seen in that "standardized students" cannot fit every job perfectly. Since the students are not specialized, employers come to hire students that are not suited for their jobs.

The curricula at St CMU, SLU, NLH and AU differ in the standardization and the freedom of choice among courses. The students at the four universities do not have the same ability to shape and individualize their education. This is discussed in the sections below concerning how much of the educations that consist of compulsory credits, elective credits or credits for individual work, which involves a period of practical training and a thesis project.

3.1.1 Compulsory credits

At St CMU, AU and the "Economics and Administration" program at NLH the curricula are highly standardized. The compulsory credits consist of over 60 % of the educational programs to become a "Master of Science". SLU and the "Economics and Resource Management" program at NLH differ in that the compulsory credits only consist of around 40 % of the educational programs, which indicates that the curricula are standardized to a lesser extent. Figure 2 below gives a survey of how directed the educational programs are by showing the extent of compulsory credits, elective credits and credits for individual work. The latter consists of the period of practical training and the thesis project, which the students do individually during their education.

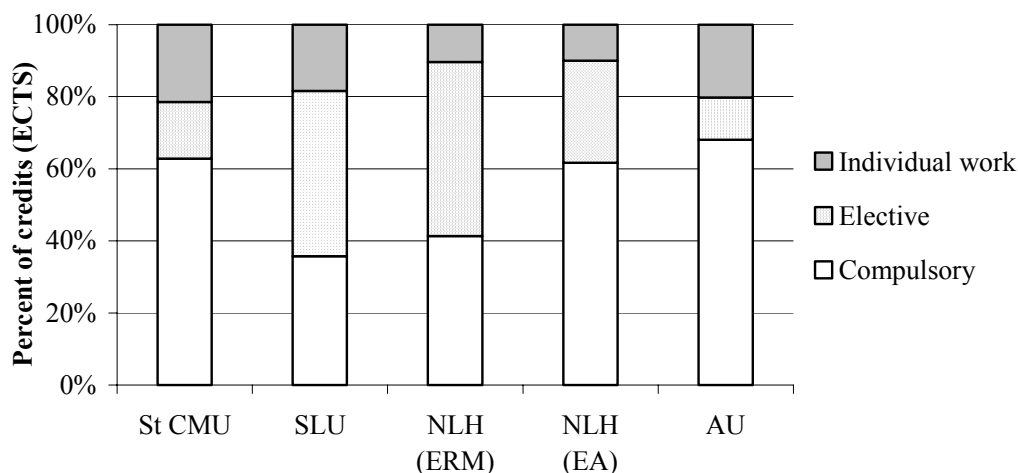


Figure 2. This figure illustrates the disposition of the education in compulsory credits, elective credits and credits for individual work (Compiled from data in St CMU 2003, SLU 2003b, NLH 2003 and Internet: AU 2004b,c).

One of the reasons for that St CMU and AU have so many compulsory credits, is that they have a very broad base in their education. The two first years of the university education the agro-economic students study together with all other agronomists. During these years they learn a lot of different subjects like biology, physics, technology and climatology. SLU also have basic courses that all the agronomists study together, but to a far lesser extent. NLH on the other hand, do not have a common study base for agronomists at all. However, NLH have three different educational programs in agro-economics, which implies that the university is not as standardized as it may look in figure 2 above. To show the differences between the universities in compulsory courses together with other agronomists table 2 below has been compiled. The table is a summary of the curricula at the universities and it also shows how constrained the programs are and how much the students can shape their education individually.

Table 2: Survey of the agro-economists curricula at St CMU, SLU, NLH and AU (Compiled from data in SLU 2003b, St CMU 2003, NLH 2003 and Internet: AU 2004b,c).

	St CMU	SLU	NLH (ERM/EA)	AU
Compulsory for agronomists	96 credits	30 credits	0 credits	80 credits
Compulsory for agro-economists	168 credits	75 credits	120/185 credits	199 credits
Elective from a specified list	66 credits	60 credits	140/85 credits	48 credits
Completely elective	0 credits	75 credits	0 credits	0 credits
Individual work	90 credits	54 credits	30 credits	83 credits
Total	420	300	290 / 300	410

The compulsory credits in the table above are divided into credits that are compulsory for the agro-economists and credits that are compulsory for all agronomists. The elective credits are divided into credits that are elective from a specified list and credits that are completely elective and can be taken at other departments and universities. Another way of showing the same information as table 2 is with a diagram. Such a diagram can be seen in figure 3 below.

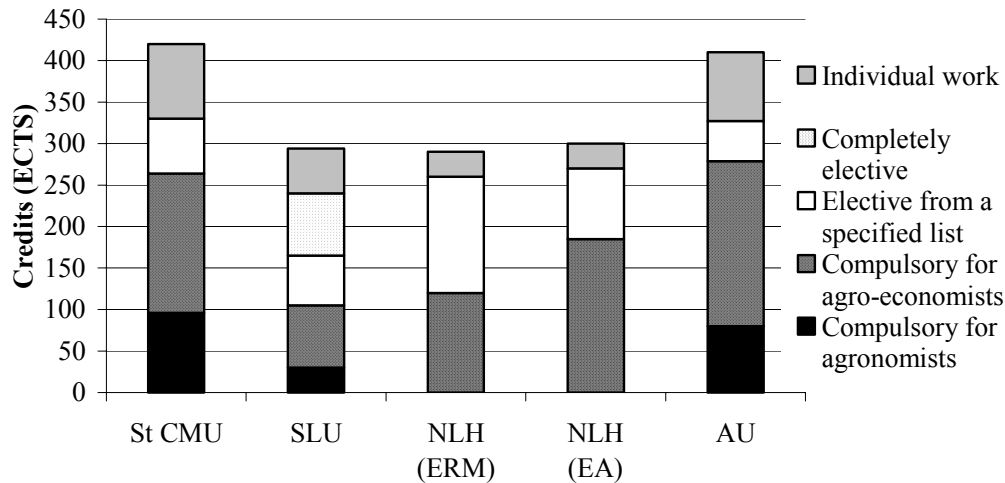


Figure 3. This diagram consists of a survey of the agro-economic curricula at St CMU, SLU, NLH and AU, illustrating how much of the education that is compulsory and how much that can be influenced by the students (Compiled from data in St CMU 2003, SLU 2003b, NLH 2003 and Internet: AU 2004b,c).

3.1.2 Elective credits

With the elective credits the students can choose what they want to focus on. At most universities there are some limitations for these choices. Mostly the elective credits have to be chosen from a specified list of courses. The amount of courses to choose from affects a student's ability to specialize. If the list of courses is extensive the freedom of choice is great, but if this list is more limited it increases the standardization of the students, since they are more likely to choose the same courses, see table 3 for a ratio between the selection of courses and the amount of elective courses required by each program.

Table 3: Ratio of the number of credits for the provided courses compared to how many credits of elective courses the student must take

University	Elective ratio
St CMU	1.6
SLU (only courses offered by Dep. of Econ.)	2.5
NLH/ERM	5.6
NLH/EA	8.9
AU	2.8 (weighted average)

At St CMU, AU and the “Economics and Administration” program at NLH not that many credits are elective (see figure 3). However, these universities differ concerning the range of courses that the students can choose from. This can be seen in figure 4 below. St CMU and AU have small selection of courses and are therefore more standardized in their education. NLH on the other hand, has a large selection of courses that is almost three times as many as the two former universities. This indicates that the students graduating from NLH are standardized to a much lesser extent than the students graduating from St CMU and AU.

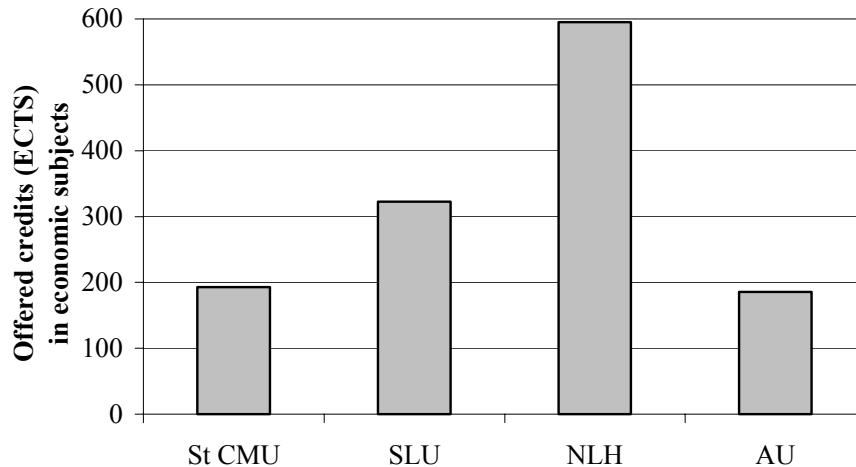


Figure 4. Offered credits in economic subjects at St CMU, SLU, NLH and AU (Compiled from data in St CMU 2003, SLU 2003b, NLH 2003 and Internet: AU 2004b,c).

SLU and the “Economics Resource Management” program at NLH have a lot of elective credits (see figure 3); almost two times as many as St CMU and AU. Furthermore, SLU and especially NLH possess a large selection of courses (see figure 4), which also indicates that these universities produce the least standardized students. Additionally, the students at SLU can easily choose courses from other departments and other universities, without any restrictions on which courses to choose. This increases the freedom of choice and decreases the extent of standardization. The bar in the diagram above only shows the courses given at the Department of Economics where the agro-economic students study. The opportunity to choose courses at other departments and universities would increase this bar greatly. Also students at St CMU, NLH and AU can take courses at other departments and universities, but it may be more specified what kind of subjects the students should take to be able to graduate.

3.1.3 Credits for individual work

The individual work is a specialization chosen by the student herself and therefore it decreases the standardization between students. The individual work mostly consists of a thesis project and a period of practical training. Figure 5 below illustrates the credits required for the individual work at the four studied universities.

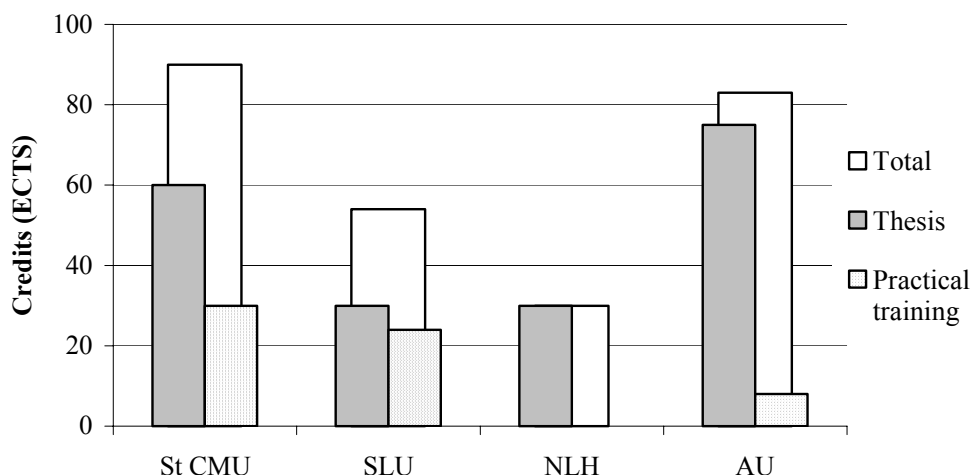


Figure 5. The figure shows the credits required for the individual work in a thesis project and a period of practical training at St CMU, SLU, NLH and AU (Compiled from data in St CMU 2003, SLU 2003b, NLH 2003 and Internet: AU 2004b,c).

The thesis project is the most significant part of the individual work. The thesis should be done within the student's main subject and it is an important opportunity for the student to apply his/her scientific knowledge and skills in practice. The students learn how to make individual judgments and how to formulate and solve problems, which is an important preparation for the labor market. At both St CMU and AU the students make two theses, one during the bachelor program and one during the master program. This is the main reason for way the bars in figure 5 above are so much greater for these universities, where St CMU have 60 credits and AU have 75 credits. SLU and NLH only have 30 credits each for the thesis projects. However, at SLU it is possible for a student to do a thesis project at a bachelor level as well, which then consists of 15 credits. This can be done instead of taking 15 credits in courses and it would increase the bar in the diagram. Whether this is possible at NLH is impossible to tell from the curriculum.

The period of practical training should be relevant for the students' education and in this way prepare them for future employments. At all universities, except NLH, the students have to get some practical training during their education. St CMU demands the longest practice of their students consisting of 30 credits. SLU do not give any credits for the practical training; however the workload of 16 weeks can be translated to 24 credits. AU demands only 8 credits of practice from their students and NLH demands none.

3.2 The curricula's disposition

Looking at the four universities' curricula, one of the first things you notice is the difference in economic subjects and in non-economic ones (see figure 6 below). In a comparison between the universities it can be stated that the students at NLH are the ones that are bound to take most credits in economic subjects. However, if the students at St CMU, SLU and Aristotle University would choose to focus as much as possible on economic subjects, they will then reach the same amount of credits as the students at NLH. In this situation, what then differs between the universities is the

amount of credits in non-economic subjects. This would mean that the students at St CMU and AU would take, roughly measured, between 60 and 100 credits more than SLU and NLH in non-economic subjects. This explains why the educational programs at St CMU and AU consist of about 100 credits more than the programs at SLU and NLH.

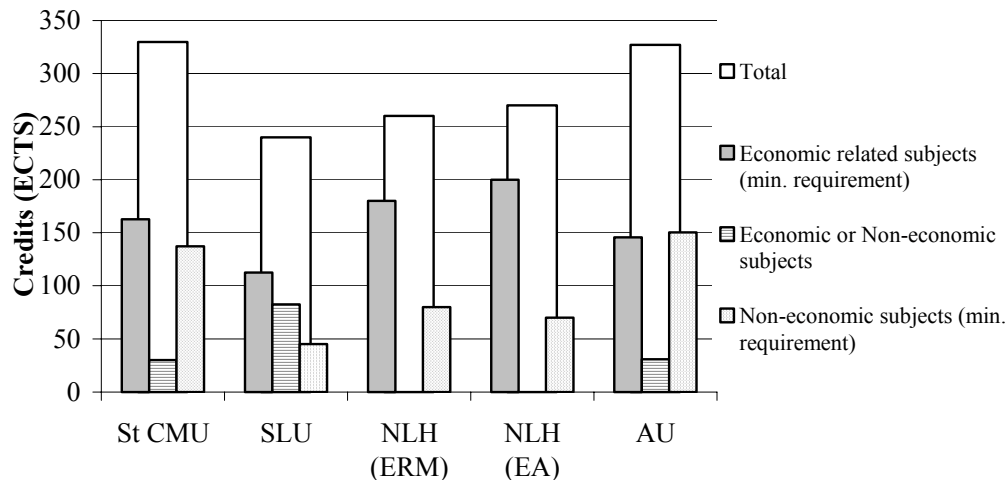


Figure 6. The diagram shows the amount of credits in economic subjects and non-economic subjects that the students can take during the educational programs at St CMU, SLU, NLH and AU (Compiled from data in St CMU 2003, SLU 2003b, NLH 2003 and Internet: AU 2004b,c).

St CMU and AU the students focus between 45 % and 60 % of their study credits on courses in economic subjects and the rest on courses in other subjects, such as mathematics, statistics, biology, chemistry, physics, and technology. At NLH the focus is set even more on economic subjects with around 70-75 % of the study credits. At SLU however, the students have a great influence on where the focus should be in their individual educations. They can choose from under 50 % to over 80 % in economic subjects and the rest, from 50 % to 20 %, in other subjects. Most common, though, is for the students to choose a stronger focus on economic subjects than on non-economic ones. The students at St CMU and AU have also the opportunity to choose their focus, but to a far lesser extent, which means around 10 % of the study credits. The students at NLH, however, cannot choose their focus on economic or non-economic subjects the university determines this.

Non-economic and economic subjects can be divided into more narrow categories. Two important non-economic subjects are mathematics and statistics. The economic subjects on the other hand can be categorized in economics and business administration. Now, are there any differences in the disposition in these subjects between the universities? The following sections will answer this question.

3.2.1 Courses in mathematics and statistics

The amount of credits taken in mathematics and statistics is of great importance, since the knowledge often is needed for courses in economics and business administration. All the universities teach basic courses in mathematics and statistics. The credits

given for these subjects differ from 15 credits at SLU, 19 credits at AU, 20 credits at NLH to 24 credits at St CMU (see figure 7 below).

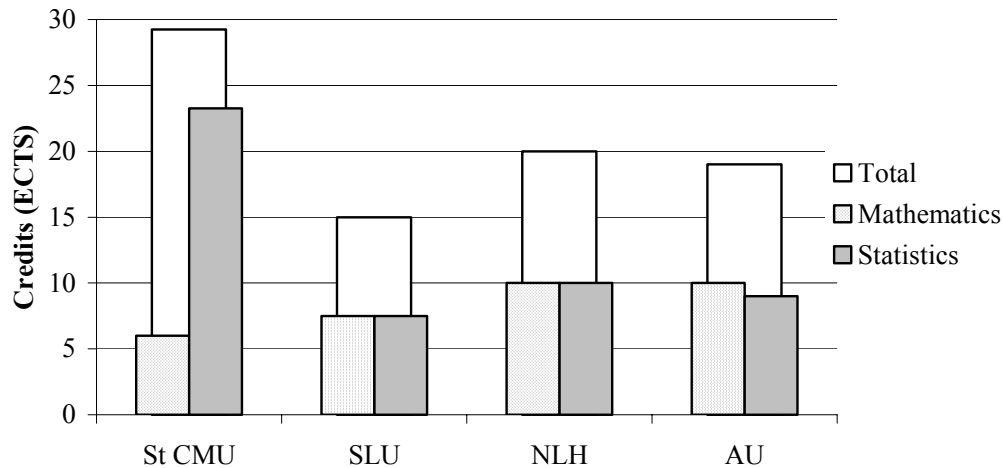


Figure 7. The diagram shows the amount of credits in statistics and mathematics that are given at St CMU, SLU, NLH and AU (Compiled from data in St CMU 2003, SLU 2003b, NLH 2003 and Internet: AU 2004b,c).

St CMU also differs from the other universities in that they focus more on statistics than on mathematics. The courses in statistics consist of about 80 % of the total amount of courses in mathematics and statistics. For the other universities the focus is about the same on statistics as it is on mathematics.

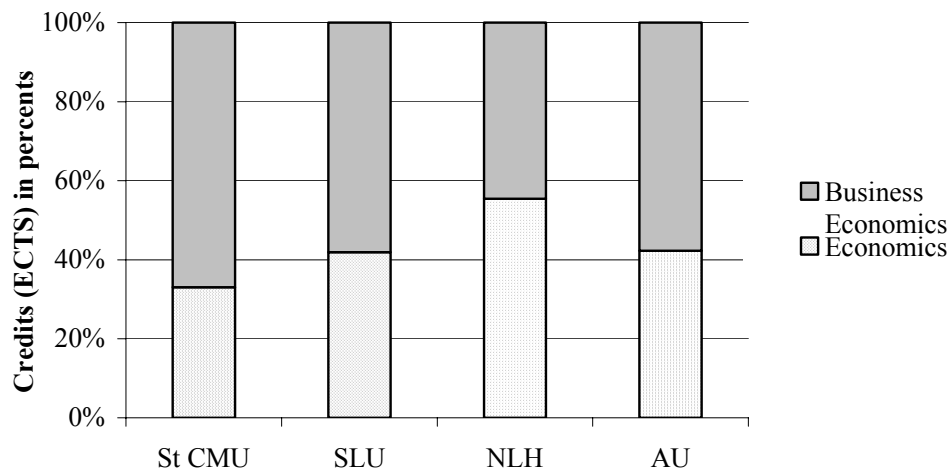


Figure 8. The diagram shows the focus on economics versus business administration as share of all economical subjects at St CMU, SLU, NLH and AU (Compiled from data in St CMU 2003, SLU 2003b, NLH 2003 and Internet: AU 2004b,c).

3.2.2 Courses in economics and business administration

There are some differences in the focus on economics and business administration between the universities. NLH focuses the most on economics with as much as 55 % of the credits in economic subjects. St CMU is focusing least at economics, 35 %, and instead more on business administration, 65 %. SLU and AU both focus over 40 % of

the courses in economics and 60 % of the courses in business administration, see figure 8 above.

The difference in the focus reflects it self in the amount of credits in economics and business administration that the students can take. As previously mentioned (see 3.1.2 *Elective credits*) NLH has the largest selection of courses in both economics and business administration. SLU also has a large selection of course and can moreover easily use other universities to increase its selection. St Cyril and Methodius University and AU on the other hand, only offer a few courses in economics, which corresponds to about 64 respectively 78 credits. For the students at St CMU this means that they will be more concentrated on business administration, even if they take every course in economics that is given. The reason is that the students have to have at least 163 credits in economic subjects (see figure 6), so even if a student take all courses in economics that are given, she still has to take around 100 credits in business administration. For AU the situation is similar. A student needs to take 146 credits in economic subjects and with the 78 credits in economics that makes less than 70 credits in business administration. Figure 9 below shows the amount of credits offered at the universities in economics and business administration.

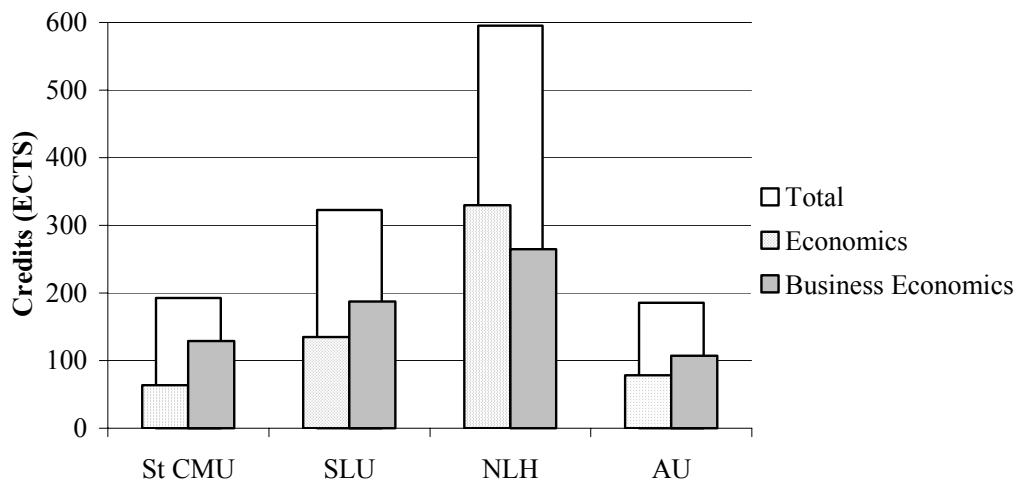


Figure 9. The diagram shows the amount of credits in economics and business administration that are given at St CMU, SLU, NLH and AU (Compiled from data in St CMU 2003, SLU 2003b, NLH 2003 and Internet: AU 2004b,c).

3.3 The content and level of the courses

This part is about the content and level of the courses in mathematics, statistics, economics and business administration at St CMU. It is foremost a comparison with the courses at SLU, where Swedish teachers have studied the Macedonian syllabi and given their view. There are three sections below: 3.3.1. *Courses in mathematics and statistics*, 3.3.2 *Courses in economics* and 3.3.3 *Courses in business administration*. Each section has a table where the Macedonian courses are listed, followed by a description of the different courses according to the Swedish teachers' impressions. To sum up, in the end of each section the syllabi are discussed in a more wide-ranging approach.

3.3.1 Courses in mathematics and statistics

St CMU offers more courses in statistics, but fewer in mathematics, than any of the other universities do (see 3.2.1 *Courses in mathematics and statistics*). In table 4 below the courses are listed in chronological order with the level of knowledge estimated by the Swedish teacher.

Table 4: The level of knowledge of the courses in mathematics and statistics offered at the St CMU (pers. comm. Lindqvist 2004a,b).

Course	Level
Bachelor of Science Program	
1. Mathematics (Compulsory, 6 credits)	Basic level
2. Statistics (Compulsory, 6 credits)	Basic level
3. Mathematical and Statistical Methods (Compulsory, 6 credits)	Basic level
Master of Science Program	
4. Statistics (Compulsory, approx. 11.25 credits)	Basic level

1. The first course “**Mathematics**” has the same breadth as the course “Basic Mathematics for Economists” that is given at SLU (pers. comm. Lindqvist 204a). The courses overlap to some extent, but they are still very different. One example is that the Macedonian students learn integrals with applications, which is absent in the course given at SLU. On the other hand the Swedish students learn analysis of several variables, which is absent in the course at St CMU. According to the consulted teacher, the Macedonian course is not specialized for economists and it is more similar to the course in mathematics given to other agronomists at SLU.
2. The course “**Statistics**” is also very broad and range over a large selection of topics (Ibid). It is well suited for economists and prepares them for future economic studies. However this course has no similarity with the basic course in statistics, “Basic Statistic Economics”, that is given at SLU. The course at SLU is according to the consulted teacher not suited for economists and will be rearranged next year.
3. The second course in statistics at St CMU is called “**Mathematical and Statistical Methods**”. It does not contain any of the topics in the course that the agro-economists at SLU take (Ibid). Instead the course overlaps to a great extent with the continuing courses in statistics given to other agronomists at SLU.
4. The third course in statistics, “**Statistics**”, is only given to master students. It is held at a basic level and overlaps fully with the course “Statistics with Econometrics” that is offered to the students at SLU as an elective course (pers. comm. Lindqvist 2004b).

To sum this up, all courses are compulsory and contain a basic level of knowledge. Some of the courses, though, are not very well suited for economists. A reason for this can be that the Macedonian students take these courses together with other

agronomists that are not focused on economic subjects. However, since the Macedonian agro-economists also learn many other subjects, like technology, biology and chemistry, they additionally need to learn appropriate elements in mathematics and statistics. The Swedish students, on the other hand, that are focused on economic subjects only need the elements in mathematics and statistics that is related to economics or business administration.

3.3.2 Courses in economics

As mentioned, St CMU offers fewer courses in economics than any of the other universities do (see 3.2.2 *Courses in economics and business administration*). Ten courses in economics have been identified in the educational program to become a “Master of Science”, which totally corresponds to 64 credits. In table 5 below the courses are listed in a chronological order with the level of knowledge that they possess. However, five of them do not only contain economics, but also elements of business administration. These courses are shadowed in the table below.

Table 5: The level of knowledge of the courses in economics offered at St CMU (pers. comm. Fahlbeck 2004a,b).

Course	Level
Bachelor of Science Program	
1. Basic Economics (Compulsory, 6 credits)	Basic level
2. Agricultural Economics (Compulsory, 6 credits)	Basic level
3. Agrarian Policy (Compulsory, 6 credits)	Basic level
4. International Agrarian Policy (Elective, 6 credits)	Intermediate level
5. Marketing of Agricultural Products (Elective, 6 credits)	Basic / Intermediate level
Master of Science Program	
6. Operational Research in Agriculture (Compulsory, ca. 11.25 credits)	Advanced level
7. Market, Prices and Marketing of Agricultural Products (Compulsory, ca. 11.25 credits)	Basic / Intermediate / Advanced level
8. Labor and Means of Labor Rationalization (Compulsory, ca. 11.25 credits)	Intermediate / Advanced level
9. Agrarian Economy (Compulsory, ca. 11.25 credits)	Intermediate / Advanced level
10. Economics and Organization of Agricultural Economies (Compulsory, ca. 11.25 credits)	Intermediate level

1. The first course, “**Basic Economics**”, gives the students basic skills in the subject and is held at a basic level (pers. comm. Fahlbeck 2004a). Such a course is also given at SLU and probably at universities in every other country. At SLU, however, the course is called “Introduction to Economics” and it consists of 15 credits compared to the 6 credits at St CMU. This means that the Macedonian

course is not as extensive as the Swedish one. Regarding the literature for the Macedonian course, most of it is not internationally recognized.

2. The course “**Agricultural Economics**” is also given at a basic level and it is focused on the agrarian sector (Ibid). The course seems to be descriptive and does not contain much theory. It is directed towards the situation in Macedonia and there are no similar courses given at SLU, even if some elements can be found in different basic economical courses.
3. The course “**Agrarian Policy**” is, just like the previous courses, interpreted as a basic course (Ibid). This course is however more theoretical than the others and it overlaps in some ways with the two courses “Microeconomics with Applications” and “Agricultural Policy and International Trade” that is given at SLU.
4. The course “**International Agrarian Policy**” is an elective course and it is given at an intermediate level (Ibid). The literature is in English, relatively new and more theoretical than the previous courses in economics. This course corresponds a lot to the course “Agricultural Policy and International Trade” at SLU, which also is given at an intermediate level.
5. “**Marketing of Agricultural Products**” is also an elective course. Some of the elements in the course seems to be relatively advanced, but regarding to the literature the level is probably basic or at the most intermediate (Ibid). The course is foremost in economics, where it contains elements such as production economics, international trade and the function of markets, but a part of the course also seems to contain some business administration. There is no course at SLU that can be compared to this one.
6. “**Operational Research in Agriculture**” is one of the first courses that are given to the master students. It is held at an advanced level and contains both economics and business administration (pers. comm. Andersson 2004). The contents correspond to the course “Production Economics” at SLU, but the elements about risk analysis are absent in the Macedonian course. However, the Macedonian course also has some elements that are absent at SLU, like network planning.
7. “**Market, Prices and Marketing of Agricultural Products**” is a master course that is partly in economics and partly in business administration (pers. comm. Fahlbeck 2004b and Mark-Herbert 2004b). The consulted teachers had some trouble to decide the level of knowledge that the course possesses. The first part of the course, which is in economics, is very basic and descriptive and does not contain much theory. It overlaps somewhat with the courses “Introduction to Economics” and “Microeconomics with Applications”, which are both given at basic levels at SLU. It also seems to overlap to some extent with “Agricultural Policy and International Trade” that is given at an intermediate level at SLU. The conclusion is therefore that this part of the course is at a basic or intermediate level. The second part of the course is in marketing and can be classified as business administration. This part has similarities to SLU’s courses “Marketing” and “Production Economics”. Looking at the topics of the Macedonian course, this part of the course seems to be at a very high level of knowledge. However, since there are many topics there cannot be enough time to deepen the knowledge

further. Therefore, it is probably at an intermediate or advanced level of knowledge.

8. **“Labor and Means of Labor Rationalization”** is a master course that probably is given at the intermediate or advanced level (pers. comm. Hakelius 2004b and Öhlmér 2004b). Just as the two previous courses it can be classified both as economics and business administration. The course overlaps somewhat with elements in the Swedish courses “Business Management”, “Organization” and “Production Economics”. There are many elements in the Macedonian course that cannot be related to any course given at SLU. These elements are for example principles connected to work movements and nutrition balance for human metabolism. An element that is missing in the Macedonian course is management.
9. For the master course **“Agrarian Economy”** the three Swedish teachers that was consulted had some trouble in relation to the level of knowledge. However, the conclusion of their statements is that the course is at an intermediate or advanced level (pers. comm. Fahlbeck 2004b, Hakelius 2004b and Öhlmér 2004b). The course is very broad and lacks the specialization that master courses at SLU often have. The content is descriptive and not very theoretical, which is also differing from the master courses at SLU. The course overlaps foremost with “Agricultural Policy and International Trade”, but also to a lesser extent with “Core Curriculum in Agricultural Sciences”, “Accounting”, and “Economic Growth and Environment”. However, compared to the latter course the environmental aspects are absent in “Agrarian Economy”.
10. **“Economics and Organization of Agricultural Economies”** is another master course that contains both economics and business administration (pers. comm. Andersson 2004a, Hakelius 2004b and Öhlmér 2004b). It is probably an intermediate course, since it is very broad and descriptive. The course correspond somewhat to the courses “Organization” and “Production Economics” at SLU, but some similarities can also be recognized with the courses “Industrial Organization – Swedish Food Industry”, “Global Food System Analysis” and “Farm Management and Medium-run Planning”.

Most courses consist of a basic or an intermediate level of knowledge. It is compulsory for both the Macedonian and the Swedish students to take courses in economics at a basic level. However, there is a difference between the universities in the highest level of knowledge offered during the bachelor program. At St CMU it is the intermediate level, where the students at SLU can take courses at the advanced level during the bachelor program as well as during the master program. At St CMU there is only one course that, without doubt, is at an advanced level and this course is only given to the master students.

When it comes to the content of the courses St CMU focuses more on the agricultural business, where SLU offers courses that are somewhat more general and can be applied to other businesses as well. This gives the students greater possibilities to take on employments in other companies than the ones in the agrarian sector. A reason for this is that SLU also offers courses to other students than the agronomists.

Another significant issue is that St CMU is the only one of the four studied universities that lacks the connection between economics and environmental aspects in their courses. SLU, as well as NLH and even AU to a lesser extent, involves environmental issues during their courses in economics and they additionally offer separate courses in environmental economics. On the other hand, St CMU has a lot of courses in biology where the students learn about environmental factors. However, the connection between the environmental and economical factors is of significant importance and is best thought and understood in courses that focus on this very connection.

3.3.3 Courses in business administration

Most of the courses in economic subjects given at St CMU are in business administration. However, as stated earlier, the selection of courses in business economics at St CMU is not very large compared to the other universities (see 3.2.2 *Courses in economics and business administration*). Twenty-one courses have been identified during the educational program to become a “Master of Science”, which totally corresponds to about 158 credits. These courses are listed in table 6 below, with the level of knowledge that they possess. Five of these courses contain elements of economics as well as business administration and they are described in 3.3.2 *Courses in economics*.

In table 6 below the courses are listed in a chronological order with the level of knowledge that they possess. The shadowed courses are the ones that contain both economics and business administration.

1. The first course is called “**Development of Human Resources**”. It is an elective course and it is probably held at a basic or intermediate level according to the consulted teachers (pers. comm. Hakelius 2004a and Öhlmér 2004a). However, since this course is the first course given in business administration the level is most likely basic. It corresponds somewhat to the course “Organization”, which is one of the introductory courses in business administration given at SLU. To some extent the academic field also overlaps with the course “Business Management”, which is held at an advanced level at SLU. Looking at the course description it seems to be a rather narrow subject. However, the course literature proposes a slightly different picture, with books in English that are relatively up to date.
2. The second course is “**Agro Management**”, which is a compulsory course held at a basic or intermediate level according to the consulted teachers (Ibid). It is hard to see what courses it corresponds to at SLU. However, just like the previous course “Development of Human Resources”, it overlaps somewhat with the Swedish courses “Organization” and “Business Management”. Some overlap can also be seen with two other Swedish courses. One of them is “Farm Management and Medium-run Planning” held at an intermediate level and the other one is “Co-operatives” held at an advanced level. This Macedonian course is not as deep and theoretical as the corresponding courses at SLU and it consists of only 6 credits.

Table 6: The level of knowledge of the courses in business administration offered at St CMU (pers. comm. Andersson 2004, Ferguson 2004, Hakelius 2004a,b, Lagerkvist 2004, Lönnstedt 2004, Mark-herbert 2004a,b, Nilsson 2004 and Öhlmér 2004a,b).

Course	Level
Bachelor of Science Program	
1. Development of Human Resources (Elective, 6 credits)	Basic / Intermediate level
2. Agro Management (Compulsory, 6 credits)	Basic / Intermediate level
3. Agro Marketing, Basics (Compulsory, 6 credits)	Basic level
4. Labor Organization (Elective, 6 credits)	Basic / Intermediate level
5. Co-operative Sector (Elective, 6 credits)	Basic / Intermediate level
6. Costs and Calculations (Compulsory, 6 credits)	Basic / Intermediate level
7. Farm Management (Compulsory, 6 credits)	Basic level
8. Farm Accounting (Compulsory, 6 credits)	?
9. Agribusiness Management (Compulsory, 6 credits)	Basic level
10. Agricultural Planning and Project Making (Compulsory, 6 credits)	Basic / Intermediate level
11. Quality Management (Compulsory, 6 credits)	Intermediate level
12. Marketing of Agricultural Products (Elective, 6 credits)	Basic / Intermediate level
13. Agricultural Financial Management (Compulsory, 6 credits)	Intermediate / Advanced level
14. Working Analysis (Elective, 6 credits)	Advanced level
15. Entrepreneurship (Elective, 6 credits)	Advanced level
Master of Science Program	
16. Operational Research in Agriculture (Compulsory, ca. 11.25 credits)	Advanced level
17. Market, Prices and Marketing of Agricultural Products (Compulsory, ca. 11.25 credits)	Basic / Intermediate / Advanced level
18. Labor and Means of Labor Rationalization (Compulsory, ca. 11.25 credits)	Intermediate / Advanced level
19. Planning and Projection in Agriculture (Compulsory, ca. 11.25 credits)	Intermediate level
20. Economics and Organization of Agricultural Economies (Compulsory, ca. 11.25 credits)	Intermediate level
21. Calculation with Financial Analysis of Operation in Agricultural Enterprises (Compulsory, ca. 11.25 credits)	Basic / Intermediate level

3. The third course in business administration is “**Agro Marketing, basics**”. It is a very broad introductory course held at a basic level (pers. comm. Mark-Herbert 2004a). The literature is in the Macedonian language and not recognized by the consulted Swedish teacher. Unlike the courses given at SLU, management of research and development is absent.
4. “**Labor Organization**” is a course at a basic or intermediate level (pers. comm. Hakelius 2004a and Öhlmér 2004a). It overlaps with two courses at SLU, “Organization” and “Business Management”, but also includes other elements such as working physiology, hygienic and technical protection and analytical judgment of the working environment. The literature is not in English and therefore not known by the consulted teachers.
5. The course “**Co-operative Sector**” is very descriptive and does not contain much theory (pers. comm. Nilsson 2004). This course gives historical reviews of the cooperative sector, presentations of traditional cooperative ideology and presentations of Macedonian cooperatives. The course is very broad and range over consumer cooperatives, financial cooperatives, agricultural cooperatives etc. Since these are very different areas the course must be held at a very basic level or at the most at an intermediate level. The course literature is not in the English language and is therefore not known by the consulted teacher. Some of the books are also relatively old.
6. The course “**Costs and Calculations**” is held at a basic or intermediate level (pers. comm. Lönnstedt 2004). Since it is the first course the students take in this particular subject it should probably be classified as a basic level course. It corresponds somewhat to the courses “Accounting” and “Financial Accounting and Analysis” given at SLU, which are courses at a basic and intermediate level respectively. The literature is unknown by the consulted teacher.
7. “**Farm Management**” is interpreted as a basic level course (pers. comm. Lagerkvist 2004). The content cannot be recognized in any course taught to the agro-economists at SLU. It contains elements like organization of wine production and fruit production. The consulted teacher was not even sure that the course is in an economic subject. Regarding the literature, it is relatively old and not internationally known.
8. “**Farm Accounting**” is a new course that has not been given to the students yet. Since it does not exist any syllabus for the course, it has not been evaluated in this report.
9. “**Agribusiness Management**” seems to be a basic level course that has no counterpart at SLU (Ibid). It belongs to the same academic field as SLU’s course “Farm Management and Medium-run Planning”. However, it does not appear to correspond to this course at all. The Macedonian course does not include any marketing, which is associated with agribusiness in the Swedish course. The literature is in English but not known by the consulted teacher.
10. “**Agricultural Planning and Project Making**” is a compulsory course at a basic or intermediate level (pers. comm. Hakelius 2004a and Öhlmér 2004a). It overlaps

to some extent with three courses at SLU, “Organization”, “Farm Management and Medium-run Planning” and “Business Management”. The consulted teachers do not recognize the literature.

11. “**Quality Management**” can be categorized as a course at an intermediate level and it contains basic knowledge in business administration within the field of quality management (pers. comm. Mark-Herbert 2004a). It is comparable to the course “Quality and Environmental Management for Economists” given at SLU, even if the Macedonian course lacks environmental management and only focus on quality management. Most of the literature is not internationally recognized.
12. “**Marketing of Agricultural Products**” is an elective course that contains both economics and business administration. See 3.3.2 *Courses in economics* for more information.
13. The course “**Agricultural Financial Management**” is held at an intermediate or advanced level (pers. comm. Lönnstedt 2004 and Andersson 2004). It overlaps somewhat with “Farm Management and Medium-run Planning” at SLU. The literature is recognized and internationally well known.
14. The course “**Working analysis**” appears to be at an advanced level (pers. comm. Lönnstedt 2004). There is no corresponding course at SLU and the literature is unknown by the consulted teacher.
15. The course “**Entrepreneurship**” is very hard to classify according to the consulted teacher, but it is probably an advanced level course (pers. comm. Ferguson 2004). It is very broad and contains the same elements as the course “Entrepreneurship and Business Development” at SLU. Something that is absent in the Macedonian course is the financing of new businesses, which the Swedish course focuses on a lot. The Macedonian course also lacks information about inventiveness and creativity and the literature is unknown.
- 16-18. “**Operational Research in Agriculture**”, “**Market, Prices and Marketing of Agricultural Products**”, “**Labor and Means of Labor Rationalization**” are all master courses that contain both economics and business administration. See 3.3.2 *Courses in economics* for more information.
19. “**Planning and Projection in Agriculture**” is a master course in business administration (pers. comm. Hakelius 2004b and Öholmér 2004b). It is probably held at an intermediate level and it consists of a great variety of topics. A part of the course corresponds somewhat to “Business Management” at SLU. However, the Macedonian course is focusing more on the agrarian perspective than the course at SLU does. This is probably a result of SLU’s change to attract more “non-agrarian students” to the university. Some elements in this Macedonian course can also be identified in other courses at SLU, like for example “Accounting” and “Production Economics”.
20. “**Economics and Organization of Agricultural Economies**” is a master course that contains both economics and business administration. See 3.3.2 *Courses in economics* for more information.

21. **“Calculation with Financial Analysis of Operation in Agricultural Enterprises”** is one of the last courses that the master students take. The course is in business administration and seems to be on a basic or intermediate level of knowledge (pers. comm. Andersson 2004a and Öhlmér 2004b). It is the kind of course that is offered by most countries in the subject and it has similarities to SLU’s courses “Management Accounting – Internal Accounting” and “Financial Accounting and Analysis”. SLU also offers an advanced course in the same academic field called “Qualitative Finance – Theory and Applications”.

In business administration there are courses given up to an advanced level of knowledge. It seems to be characteristic that many of the courses at St CMU’s master program are quite descriptive, not very theoretical and have a relatively low level of knowledge compared to the courses at SLU. A master program are supposed to prepare the students for future scientific research and should therefore be more theoretical and at a high level of knowledge. However, at St CMU the students can take courses in business administration at the advanced level during the bachelor program as well as during the master program. As previous stated this is not possible at St CMU for courses in economics, where the advanced courses only are given during the master program.

For courses in business administration, just as in economics, St CMU focuses more on the agricultural business, where SLU offers courses that are somewhat more general and can be applied to other businesses as well. St CMU also lacks the connection between business administration and environmental aspects in their courses. SLU as well as NLH, and AU to a lesser extent, involve environmental issues during their courses in business administration. SLU and NLH additionally offer separate courses that focus on the connection between business administration and environmental aspects.

3.4 The methods for learning

The working methodology that the students learn to use at the university is of great significance. The practice of using computers, writing essays and critical thinking gives the students skills that could prove to be very important in their future employments at the labor market. How these practices differ between the three universities St CMU, SLU and NLH is discussed below. AU is left out of this comparison because of the lack of information.

3.4.1 Use of computers in the education

The exercise of computers in the education differs between the universities (se appendices 1-3). At St CMU the students do not use computers on a regular basis as they do at SLU and NLH. When it comes to specific practices involving computers, this proposes a slightly different picture. SLU uses computers during six different courses according to the syllabi. The courses that involve computer practices are in the subjects of mathematics, statistics, economics, business administration and agricultural science. St CMU on the other hand uses computers during three courses,

of which two courses are in informatics. Looking at the syllabi for these courses, they contain basic computer skills that the students at SLU and NLH are expected to have from previous education. However, regarding NLH's computer practices only two courses involve computers according to the syllabi.

3.4.2 Written assignments

The students writing skills are very hard to determine from the syllabi. What we can measure is the practice that the students get during their education. This practice could be to turn in written assignments, projects, essays and exams. Appendices 1-3 shows the written elements for each course that takes place during the agro-economic education at St CMU, SLU and NLH.

At St CMU the students are seldom given written assignments and written exams is not that common either. The exams are mostly performed orally but sometimes there are written ones. This lack of written assignments is very different from SLU and NLH, where the students often have to turn in written assignments, projects and essays to pass the courses. Additionally the exams are nearly always in a written form.

3.4.3 Critical and analytical thinking

We are living in a time where large and rapid changes are a part of the every day life. It is hard to stay up to date with these changes. Because of this it is of significant importance to make sure that the graduated students continually adapt to their surroundings. The students must be able to use their knowledge in the future and this knowledge should not become expired or out of date. Therefore it is important that the students can think in a critical and analytical way, which will help them apply their knowledge in new situations. This way of thinking can be practiced during discussion seminars and project assignments. Such a critical and analytical way of thinking is learning for life – learning that lasts in a changing world.

At SLU and NLH this way of learning is in focus during the students' whole education. Almost every course has some elements where the students must analyze or discuss a certain matter. This condition does not seem to be the case at St CMU. According to the syllabi the Macedonian students seldom have discussion seminars or write critical or analytical reports. The courses seem to be very detailed and do not teach the students how to apply their knowledge on new and different situations. Several students at St CMU have confirmed this.

4 Conclusions

Here are the conclusions that have been drawn in the previous chapters summarized. The focus is kept on the five issues mentioned in the objective of this report: 1) the educational system, 2) the curricula's standardization, 3) the curricula's disposition, 4) the content and the level of the courses and finally 5) the methods for learning.

4.1 The educational system

Macedonia, Sweden, Norway and Greece all have about the same requirements for previous years of studies of elementary and secondary educations, when students apply for university. However, when it comes to the university education the universities that have been studied differ in the amount of years studied to graduate as a "Master of Science". St CMU and AU demand two and 2.5 more years of study than SLU and NLH do respectively. Concerning the length of the study year it is about the same at all universities, except for NLH where the study year is slightly longer.

St CMU together with SLU and AU use a system with two main cycles. NLH, however, is differing from the others in that it has three main cycles, with a graduate level between the undergraduate and postgraduate level, as suggested in the Bologna Declaration. Another important difference is that the "Master of Science" is at an undergraduate level at SLU and a graduate or postgraduate level at the other universities.

4.2 The curricula's standardization

The curricula at St CMU and AU are the most standardized ones compared to the other universities. Over 60 % of the study credits are in compulsory courses, the elective credits are few and the selection of courses is very limited. All this implies that the students will be quite standardized. However, these universities have a lot of credits in individual work, but it cannot fully compensate for the fact that the curricula are rather standardized. The "Economics and Administration" program at NLH is also quite standardized. It has about the same percent of compulsory and elective courses as St CMU and AU and additionally few credits in individual work. However, NLH has a large selection of courses, which compensates somewhat for this and makes the students less standardized. Moreover, the students at NLH have three different educational programs to choose between, which indicates a lower degree of standardization compared to the other universities that only have one educational program. SLU and also the "Economics and Resource Management" program at NLH produce the least standardized students in that they have few compulsory credits, many elective credits and a large selection of courses to choose from.

4.3 The curricula's disposition

All the universities in the study are offering their students about the same amount of economic subjects. What differs between them is that St CMU and AU offer 60-100

credits more in non-economic subjects than the other universities do. This means that St CMU and AU have a stronger focus on non-economic subjects than the others. During these subjects the students take courses in for example biology, technology and agricultural science and thereof receive a broader base in their education. Instead the students at NLH have a much stronger focus on economic subjects than the other universities. It is more difficult to determine the focus that the students at SLU have, since SLU offers the students a great opportunity in choosing their focus. This means that the students can be very focused either in non-economic subjects or in economic subjects. They can also adopt any focus in between.

Two important non-economic subjects are mathematics and statistics. There is a difference in the disposition in these subjects between the universities. St CMU teaches less mathematics but a lot more statistics than the others do; thus, St CMU focuses on statistics, while the other universities teaches the same amount of credits in mathematics as in statistics.

When it comes to the focus in economics or business administration there is also a difference between the universities. St CMU focuses more in business administration than the others and NLH focuses more in economics. SLU and AU are in between the other two. Something worth mentioning is that St CMU has so few courses in their selection that it is limiting the students' ability to focus their education on economics to a full extension.

4.4 The content and level of the courses

All courses in mathematics and statistics contain a basic level of knowledge. Some of the courses are not very well suited for economists, but these courses are probably needed since the Macedonian students also study other subjects such as technology, biology and chemistry.

Most courses in economics consist of a basic or an intermediate level of knowledge. The highest level of knowledge offered in courses during the bachelor program seems to be the intermediate level, which differs from SLU, where students can take courses at the advanced level during the bachelor program. When it comes to courses in business administration, there are courses given up to an advanced level during the bachelor program as well as during the master program. What is surprising is that many of the courses at St CMU's master program are quite descriptive, not very theoretical and have a relatively low level of knowledge compared to the courses at SLU.

When it comes to the content of the courses in economics and business administration, St CMU focuses more on the agricultural business, where SLU offers courses that are somewhat more general and can be applied to other businesses as well. Furthermore, St CMU is the only of the four studied universities that lacks the connection between economic subjects and environmental aspects in their courses. SLU, NLH and, to a lesser extent, AU involve environmental issues during their courses in economics and business administration. Additionally they offer separate courses in environmental economics or in environmental business administration.

What also is worth noting is that St CMU has many courses that contain both economics and business administration, while SLU often is trying to classify their courses as either or.

4.5 The methods for learning

The methods for learning that this report has focused on are computer practices, written assignments and critical and analytical thinking. SLU has the most computer practices during their courses compared to NLH and St CMU. Not only the computer practices during specific courses are important in learning to use computers. It is also important that the students have access to computers regularly, so they can practice their computer knowledge. At SLU and NLH the students are expected to have basic computer skills from previous studies and they are provided with computers that they have access to on a regular basis. This is not the case at St CMU, where there are no computers that the students can use regularly.

Concerning written assignments as a method for learning, the students at St CMU are seldom given any written assignments or projects. Written exams are also very rare. At SLU and NLH the picture is totally different, where the students often have to turn in written assignments and projects to pass the courses. Additionally the exams are nearly always in a written form.

The practice of critical and analytical thinking is in focus during the students' whole education at both SLU and NLH. This condition does not seem to be the case at St CMU, where the students seldom have discussion seminars or write critical or analytical reports.

5 Discussion

This report constitutes the background material needed for the meeting where St CMU's education will be discussed. Therefore, this chapter proposes important questions and issues that need to be concerned.

1. The length of the university education at St CMU

The students study two years together with other agronomists, is this necessary or not? Does the labor market in Macedonia want this kind of education? Is there a risk for this extended education of becoming too expensive for the Macedonian students versus their future employments?

2. The curricula's standardization

The Macedonian curriculum is very standardized compared to the other universities studied in this report. What do you think about that? Can there be a way to increase the selection of courses and the amount of elective credits?

3. The curriculum's disposition

St CMU's curriculum is mostly focused on business administration. Is there a need for more courses in economics?

4. The level of the courses

Is there a need for a higher level of knowledge concerning the courses at the bachelor program respectively the master program?

5. The importance of environmental aspects

Is there a need for environmental aspects to be incorporated in the education? Does the labor market, the government or the society request this?

6. The agricultural focus

How much should an agricultural university focus on the agricultural business? Are there advantages in also focusing on other businesses, regarding the students' chances on the labor market?

7. Methods for learning

How can the Macedonian methods for learning be improved?

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Appendix 1: The agro-economic education at St CMU

BL=Basic Level IL=Intermediate Level AL=Advanced Level

The shadowed fields are courses in non-economic related subjects.

Compulsory for all agronomists (96 credits in ECTS)			
Subject	Course Level, Credits (ECTS)	Written assignments	Use of computers
Biology	Botany 6 credits	None	None
Biology	Ecology 6 credits	None	None
Biology	Genetics 6 credits	None	None
Biology	Microbiology 6 credits	None	None
Chemistry	Chemistry 6 credits	None	None
Soil Science	Soil Science 6 credits	None	None
Agricultural Science	Basics in Animal Production 6 credits	None	None
Agricultural Science	Basics in Plant Production 6 credits	None	None
Languages	Foreign Languages (English or French) 12 credits	Written exam	None
Sports	Sports 0 credits	None	None
Mathematics	Mathematics BL 6 credits	Written exam	None
Statistics	Statistics BL 6 credits	None	None
Statistics	Mathematical and Statistical Methods BL 6 credits	None	None
Economics	Basic Economics BL 6 credits	Sometimes written exam	None
Economics	Agricultural Economics BL 6 credits	None	None
Business administration	Agro Management BL/IL 6 credits	?	None

Compulsory for agro-economists (78 credits in ECTS)			
Agricultural History	Rural Development 6 credits	None	None
Technology	Selected Technologies in Wine and Fruit Production 6 credits	?	None
Technology	Selected Technologies in Gardening and Crop Production 6 credits	Sometimes written exam	None
Technology	Selected Technologies in Live Stock Production 6 credits	None	None
Economics	Agrarian Policy BL 6 credits	None	None
Business administration	Agro Marketing, Basics BL 6 credits	?	None
Business administration	Costs and Calculations BL/IL 6 credits	Sometimes written exam	None
Business administration	Farm Management BL 6 credits	None	None
Business administration	Farm Accounting <i>New course that yet hasn't been given</i> 6 credits	<i>New course that yet hasn't been given</i>	<i>New course that yet hasn't been given</i>
Business administration	Agribusiness Management BL 6 credits	None	None
Business administration	Agricultural Planning and Project Making BL/IL 6 credits	None	None
Business administration	Quality Management IL 6 credits	None	None
Business administration	Agricultural Financial Management IL/AL 6 credits	None	None
Compulsory for agro-economists (Master students, 90 credits in ECTS) This gives approx. 90 credits/8 courses=11.25 credits/course			
Statistics	Statistics BL ca. 11.25 credits		
Economics/ Business administration	Operational Research in Agriculture AL ca. 11.25 credits		

Economics/ Business administration	Market, Prices and Marketing of Agricultural Products BL/IL/AL ca. 11.25 credits		
Economics/ Business administration	Labor and Means of Labor Rationalization IL/AL ca. 11.25 credits		
Economics	Agrarian Economy IL/AL ca. 11.25 credits		
Business administration	Planning and Projection in Agriculture IL ca. 11.25 credits		
Economics/ Business administration	Economics and Organization of Agricultural Economies IL ca. 11.25 credits		
Business administration	Calculation with Financial Analysis of Operation in Agricultural Enterprises BL/IL ca. 11.25 credits		
Elective from a specified list (66 credits in ECTS)			
Biology	Zoology 6 credits	None	None
Biology and Chemistry	Biochemistry 6 credits	Sometimes written exam	Computer exam Computer program
Agricultural Science	Agricultural Climatology 6 credits	Written exam Written project	None
Technology	Basic Agricultural Technology 6 credits	None	None
Informatics	Agricultural Informatics 6 credits	Written exam	The whole course is about computers
Informatics	Computers Analysis and Informational Technology 6 credits	None	Computer analysis Information technology
Technology	Food Technology, Basics 6 credits	None	None

Technology	Standardization of Farm Products 6 credits	None	None
Law	Agricultural Law BL 6 credits	None	None
Law	Agricultural Taxation BL 6 credits	Sometimes written exam	None
Economics	International Agrarian Policy IL 6 credits	None	None
Economics/ Business administration	Marketing of Agricultural Products BL/IL 6 credits	?	None
Business administration	Development of Human Resources BL/IL 6 credits	?	None
Business administration	Labor Organization BL/IL 6 credits	?	None
Business administration	Co-operative Sector BL/IL 6 credits	None	None
Business administration	Working Analysis AL 6 credits	Sometimes written exam	None
Business administration	Entrepreneurship AL 6 credits	None	None
Individual work (90 credits in ECTS)			
Economics/ Business administration	Practical Training 30 credits	?	?
Economics/ Business administration	Degree Thesis (Bachelor of Science) 30 credits	Written thesis	?
Economics/ Business administration	Degree Thesis (Master of Science) 30 credits	Written thesis	?

Appendix 2: The agro-economic education at SLU

BL=Basic Level IL=Intermediate Level AL=Advanced Level

The shadowed fields are courses in non-economic related subjects.

Compulsory for all agronomists (30 credits in ECTS)			
Subject	Course Level, Credits (ECTS)	Written assignments	Use of computers
Agricultural Science	Core Curriculum in Agricultural Science BL 30 credits	Written exam Written project	Computer knowledge
Compulsory for all agro-economists (75 credits in ECTS)			
Mathematics	Basic Mathematics for Economists BL 7.5 credits	Sometimes written exam	Computer exercise
Statistics	Basic Economic Statistics BL 7.5 credits	Sometimes written exam	Computer exercise
Economics	Introduction to Economics BL 15 credits	Written exam	None
Economics	Microeconomics with Applications BL 15 credits	Written exam Written assignment	None
Business administration	External Accounting BL 7.5 credits	Written exam Written assignment	None
Business administration	Management Accounting A2 – Internal Accounting BL 7.5 credits	Written exam Written assignment	None
Business administration	Marketing BL 7.5 credits	Written exam	None
Business administration	Organization BL 7.5 credits	Written exam Written assignment	None
Elective from a specified list (60 credits in ECTS)			
Law	Law and Real Property BL 7.5 credits	Written exam	None
Economics	Agricultural Policy and International Trade IL 15 credits	Written exam	None

Economics	Global Food System Analysis AL 7.5 credits	Written PM	Computer exam Computer exercise
Economics	Economic Growth and Environment AL 7.5 credits	Written exam Written essay	None
Economics	Industrial Organization–Swedish Food Industry AL 7.5 credits	Written exam	None
Business administration	Farm Management and Medium-run Planning IL 15 credits	Written exam 3 written projects	None
Business administration	Business Management AL 15 credits	Written exam 2 written group projects	None
Business administration	Quantitative Finance – Theory and Applications AL 15 credits	Written exam Written assignment Written group project	None
Business administration	Co-operatives AL 15 credits	Written exam Written project	None
Business administration	Production Economics AL 15 credits	Written exam Written project	Computer exercise
Elective (75 credits in ECTS of the courses above and below or courses from other departments or universities)			
Law	Taxation BL 15 credits	Written exam	None
Law	Basic course in Commercial Law BL 15 credits	2 written exams Written project?	None
Law	Basic course on Law BL 15 credits	Written exam Sometimes written assignment	None
Law	Environmental Legislation BL 7.5 credits	Written exam Written project	None
Other subjects	Quality and Environmental Management for Economists IL 15 credits	Written exam Written project	None
Economics	Degree Thesis (Bachelor of Science) AL 15 credits	Written essay	None

Economics	Natural Resource and Environmental Economics, review course BL 7.5 credits	Written home exam Written exam	None
Economics	Macro Economics, Intermediate level IL 15 credits	Written exam Written PM	None
Economics	Natural Resource and Environmental Economics IL 15 credits	Written exam Written assignment	None
Economics	Advanced Micro Economics AL 15 credits	Written exam Written assignment?	None
Business administration	Production Economics, review course BL 7.5 credits	Written exam Written group project	Computer exercise
Business administration	Financial Accounting and Analysis IL 7.5 credits	Written exam Written assignment	?
Business administration	Managerial Accounting and Analysis IL 7.5 credits	Written exam Written assignment Written project	?
Business administration	Applied Marketing IL 15 credits	Written exam Written reports	None
Business administration	Entrepreneurship and business development AL 15 credits	Written exam Written PM Written essay	None
Business administration	International Marketing AL 15 credits	Written exam Written group project	None
Business administration	Degree Thesis (Bachelor of Science) AL 15 credits	Written essay	None
Individual work (54 credits in ECTS)			
Economics/ Business administration	Degree Thesis (Master of Science) AL 30 credits	Written essay	None
Economics/ Business administration	Practical Training (approx. 24 credits)	?	?

Appendix 3: The agro-economic education at NLH

BL=Basic Level IL=Intermediate Level AL=Advanced Level

The shadowed fields are courses in non-economic related subjects.

Compulsory courses for all agro-economists (95 credits in ECTS)			
Subject	Course Level, Credits (ECTS)	Written assignments	Use of computers
Mathematics	Introductory Mathematics/Calculus 1 BL 10 credits	Written exam (Written assignment)	None
Statistics	Statistics BL 10 credits	Written exam Written assignment	Computer exercises
Methodology	Examen philosophicum BL 10 credits	Written exam	None
Economics	Economics I BL 5 credits	Written exam	None
Economics	Microeconomics – Consumers, producers, market and welfare IL 10 credits	Several written exams Written assignments	None
Economics	Microeconomics II – Institutions, games and market failures IL 10 credits	Written exams Written assignment	None
Economics	Econometrics I B 10 credits	Written exam Written project	None
Economics	Economics II IL 5 credits	Written exam	None
Business administration, Administrations Organization and Social Science (AOS)	Introduction to organization theory BL 5 credits	Written project	None
Business administration (AOS)	Research in social science IL 5 credits	Written exam	None
Business administration	Managerial economics, introduction BL 5 credits	Written exam	None
Business administration	Management science – principles IL 10 credits	Written exam Three written assignments	None

Compulsory courses for Economics and Resource Management (Economics) (25 credits in ECTS)			
Economics	Economic history BL 5 credits	Written exam Written project	None
Economics	Environmental and resource economics BL 5 credits	Written exam	None
Economics	Project evaluation and environmental valuation IL 10 credits	Written group project	None
Business administration	Industrial economics BL 5 credits	Two written projects	None
Compulsory courses for Economics and Administration (Business administration) (90 credits in ECTS)			
Law	Jurisprudence I BL 5 credits	Written exam	None
Business administration (AOS)	Marketing management BL 5 credits	Written essay	None
Business administration (AOS)	The psychology of organization and leadership IL 5 credits	Written project	None
Business administration (AOS)	Organizational structures and design IL 5 credits	Written project Case analysis	None
Business administration (AOS)	Strategic planning IL 5 credits	Written project	None
Business administration (AOS)	Organization and leadership AL 15 credits	Written group projects	None
Business administration	Accounting – Financial reporting BL 10 credits	Written exam Written project	None
Business administration	Tax law for business BL 5 credits	?	None
Business administration	Managerial accounting and budgeting IL 10 credits	Written exam	None
Business administration	Finance and investment IL 10 credits	Written exam Written assignment	None
Business administration	Business decisions methods AL 5 credits	Written exam	None
Business administration	Applied business (integration course) AL 10 credits	Written project	None

Elective from a specified list within the field of economics

Economic and Resource Management (90 credits in ECTS):

45 credits (of which 18-20 credits are Economics) +

45 credits (at the Advanced level, “AL”)

Courses written in italics and marked ERM are compulsory for students at the Economic and Resource Management program. Those courses have already been taken.

Economics and Administration (50 credits in ECTS):

30 credits +

20 credits (of which 15 credits are at the Advanced Level, “AL”)

Courses written in italics and marked EA are compulsory for students at the Economics and Administration program. Those courses have already been taken.

<i>Economics ERM</i>	<i>Economic history BL 5 credits</i>	<i>Written exam Written project</i>	<i>None</i>
<i>Economics ERM</i>	<i>Environmental and resource economics BL 5 credits</i>	<i>Written exam</i>	<i>None</i>
<i>Economics ERM</i>	<i>Project evaluation and environmental valuation IL 10 credits</i>	<i>Written group project</i>	<i>None</i>
Economics	Introduction to development economics BL 5 credits	Written exam Written assignment	None
Economics	Industrial organization IL 5 credits	Written group project	None
Economics	International economics IL 5 credits	Written exam	None
Economics	History of economic thought IL 5 credits	Written exam Written project	None
Economics	History of agriculture and forestry IL 5 credits	Written exam	None
Economics	Research in development economics IL 5 credits	Written term paper	None
Economics	Microeconomics for development IL 5 credits	Written “take home” exam	None
Economics	Development economics – macro IL 10 credits	Written exam Two written assignments	None
Economics	Agricultural policy IL 5 credits	Written exam	None

Economics	Industrial and regional policy IL 5 credits	Written exam Written project	None
Economics	Recourse and environmental economics IL 10 credits	Written exam	None
Economics	Natural resource economics IL 5 credits	Written exam Written assignments	None
Economics	Resource economics – Institutional economics IL 5 credits	Written assignments Written group project	None
Economics	Energy economics IL 10 credits	Written exam	None
Economics	Applied econometrics AL 10 credits	Written exam Written assignment	None
Economics	Agricultural market analysis AL 15 credits	Written exam Written project	None
Economics	Economics III AL 5 credits	Written exam	None
Economics	Commodities and international economics AL 15 credits	Two written exams Written assignment	None
Economics	International economics and finance AL 5 credits	Written exam	None
Economics	Development and environment AL 15 credits	Written exam	Computer exercises
Economics	Agricultural policy and resource management AL 15 credits	Written assignment	None
Economics	Environmental and resource economics (part I) AL 10 credits	Written exam Written assignment	None
Economics	Environmental and resource economics (part II) AL 10 credits	Written group project	None
Economics	Environmental accounting and management AL 5 credits	Written group project	None
Economics	Natural resource economics AL 10 credits	Written homework?	None
Economics	Energy economics II AL 10 credits	Written project	None

Economics	Development economics: Methods and policy analysis AL 20 credits	Written exam Written paper	None
Economics	Institutions, property rights and development AL 10 credits	Written project	None
Economics	Economic development, structural change and growth AL 10 credits	Written project	None
Economics	Topics in resource economics AL 10 credits	Written project	None
Economics	The economics of regulations AL 10 credits	Written project	None
<i>Business administration ERM</i>	<i>Industrial economics BL 5 credits</i>	<i>Two written projects</i>	<i>None</i>
<i>Business administration EA</i>	<i>Accounting – Financial reporting BL 10 credits</i>	<i>Written exam Written project</i>	<i>None</i>
Business administration	Agricultural accounting and tax systems BL 5 credits	Written exam	None
Business administration	Aquaculture economics BL 5 credits	Written exam	None
<i>Business administration EA</i>	<i>Tax law for business BL 5 credits</i>	?	<i>None</i>
Business administration	Business start-up BL 5 credits	Written project	None
<i>Business administration EA</i>	<i>Managerial accounting and budgeting IL 10 credits</i>	<i>Written exam</i>	<i>None</i>
<i>Business administration EA</i>	<i>Finance and investment IL 10 credits</i>	<i>Written exam Written assignment</i>	<i>None</i>
Business administration	Operations management IL 10 credits	Written exam	None
Business administration	Aquaculture economics and management IL 10 credits	Written project	None
Business administration	Applied business administration IL 10 credits	Written test Written project	None
Business administration	Business law/Corporate law IL 5 credits	Written exam	None

Business administration	Topics in business IL 5 credits	Written project	None
<i>Business administration EA</i>	<i>Applied business (integration course) AL 10 credits</i>	<i>Written project</i>	<i>None</i>
<i>Business administration EA</i>	<i>Business decision methods AL 5 credits</i>	<i>Written exam</i>	<i>None</i>
Business administration	Applied simulation modeling AL 5 credits	Written test Written assignment	None
Business administration	Supply chain management AL 5 credits	Written exam	None
Business administration	Economic development and entrepreneurship AL 15 credits	Written exam Written assignment	None
Business administration	Economic development and entrepreneurship I AL 5 credits	Written exam Written assignment	None
Business administration	Topics in business administration AL 10 credits	Sometimes written exam and project	None
<i>Business administration (AOS) EA</i>	<i>Marketing management BL 5 credits</i>	<i>Written essay</i>	<i>None</i>
Business administration (AOS)	Rural sociology IL 10 credits	Written exam Written project	None
Business administration (AOS)	Political structures and processes IL 10 credits	Written exam Written project	None
Business administration (AOS)	Market oriented product development IL 5 credits	Written project	None
<i>Business administration (AOS) EA</i>	<i>The psychology of organization and leadership IL 5 credits</i>	<i>Written project</i>	<i>None</i>
<i>Business administration (AOS) EA</i>	<i>Organizational structures and design IL 5 credits</i>	<i>Written project Case analysis</i>	<i>None</i>
<i>Business administration (AOS) EA</i>	<i>Strategic planning IL 5 credits</i>	<i>Written project</i>	<i>None</i>
Business administration (AOS)	Strategic processes and decision-making IL 10 credits	Written project Case analysis	None
Business administration (AOS)	Course in leadership for elected NLH students representatives IL 10 credits	Written project	None

Business administration (AOS)	Environmental politics and management AL 10 credits	Written project	None
<i>Business administration (AOS) EA</i>	<i>Organization and leadership AL 15 credits</i>	<i>Written group projects</i>	<i>None</i>
Elective directions from a specified list within the field of natural science/ technology			
Economic and Resource Management (50 credits in ECTS): 30 + 20 credits			
Economics and Administration (35 credits in ECTS): 15 + 20 credits			
Natural science/ Technology	Nature and environmental management	?	?
Natural science/ Technology	Soil and plantation	?	?
Natural science/ Technology	Domestic animals	?	?
Natural science/ Technology	Aquaculture	?	?
Natural science/ Technology	Food science and biotechnology	?	?
Natural science/ Technology	Forrest	?	?
Natural science/ Technology	Forrest industry	?	?
Natural science/ Technology	Renewable energy sources	?	?
Natural science/ Technology	Agriculture in the tropics	?	?
Natural science/ Technology	Area planning and law	?	?
Natural science/ Technology	Quantitative methods	?	?
Natural science/ Technology	Building techniques	?	?
Individual work (30 credits in ECTS)			
Economics/ Business administration	Degree Thesis (Master of Science) AL 30 credits	Written essay	?

Appendix 4: The agro-economic education at AU

The shadowed fields are courses in non-economic related subjects.

Compulsory for all agronomists (80 credits in ECTS)			
Subject	Course Credits (ECTS)	Written assignments	Use of computers
Mathematics	General Mathematics 5 credits	?	?
Statistics	Statistics 4 credits	?	?
Physics	Physics 5 credits	?	?
Chemistry	General and Inorganic Chemistry 6 credits	?	?
Chemistry	Organic Chemistry 6 credits	?	?
Biology	Plant Anatomy and Morphology 5 credits	?	?
Biology	Plant Physiology 5 credits	?	?
Biology	General Ecology 5 credits	?	?
Biology	Systematic Botany 5 credits	?	?
Soil Science	Soil Science 5 credits	?	?
Climatology	Meteorology – Climatology 5 credits	?	?
Language	Foreign Language 16 credits	?	?
Economics	Principles of Economics 4 credits	?	?
Business administration	Agricultural Economics 4 credits	?	?
Compulsory for agro-economists (139 credits in ECTS)			
Mathematics	General Mathematics II 5 credits	?	?
Statistics	Statistics for Agro- Economists 5 credits	?	?
Biology (Genetics)	Animal Breeding and Farming 4 credits	?	?

Agricultural Science	Principles of Agronomy 5 credits	?	?
Sociology	Sociology 4 credits	?	?
Sociology	Agricultural Education 5 credits	?	?
Sociology	Rural Sociology 4 credits	?	?
Sociology	Social Demography 5 credits	?	?
Agricultural Science	Field Crops I (Cereals, Legumes, Forages) 5 credits	?	?
Agricultural Science	Introduction to Vegetable Crops Production II 3 credits	?	?
Agricultural Science	Field Crops II (Industrial Crops) 4 credits	?	?
Technology	Farm Mechanization 5 credits	?	?
Economics	Microeconomic Analysis 4 credits	?	?
Economics	Macroeconomic Analysis 4 credits	?	?
Economics	Agricultural Policy 5 credits	?	?
Economics	Agricultural Macroeconomics and Comparative Analysis 5 credits	?	?
Economics	International Trade of Agricultural Products 5 credits	?	?
Economics	Agricultural Policy and International Institutions 5 credits	?	?
Economics/ Business administration	Methods of Quantitative Analysis 5 credits	?	?
Business administration	Cooperation 4 credits	?	?
Business administration	Agricultural Production Economics 4 credits	?	?
Business administration	Farm Accounting and Appraisal 5 credits	?	?

Business administration	Agricultural Cooperation 5 credits	?	?
Business administration	Agricultural Extension 5 credits	?	?
Business administration	Farm Management 5 credits	?	?
Business administration	Marketing of Agricultural Products 5 credits	?	?
Business administration	Agricultural Finance and Project Appraisal 4 credits	?	?
Business administration	Productivity and Planning in Agriculture 5 credits	?	?
Business administration	Agricultural Economic Development 5 credits	?	?
Business administration	Agricultural Economic Research 5 credits	?	?
Compulsory for agro-economists (Master students, approx. 60 credits in ECTS) This gives approx. 60 credits/16 courses=3.75 credits/course			
Sociology	Rural Sociology and Social Demography ca. 3.75 credits	?	?
Sociology	Agricultural Education and Sociology of Education ca. 3.75 credits	?	?
Sociology	Sociology of Development and Rural Community Development ca. 3.75 credits	?	?
Economics	Micro and Macro Analysis ca. 3.75 credits	?	?
Economics	Agricultural Policy ca. 3.75 credits	?	?
Economics	Economics of Food Industries and Cooperatives ca. 3.75 credits	?	?
Economics	Economics of Natural Resources and Environment ca. 3.75 credits	?	?
Economics	Special Issues ca. 3.75 credits	?	?

Economics/ Business administration	Agricultural Economic Development and Comparative Agricultural Economics ca. 3.75 credits	Written essay	?
Economics/ Business administration	Quantitative Methods ca. 3.75 credits	?	?
Business administration	Agricultural Production Economics ca. 3.75 credits	?	?
Business administration	Economics of Agricultural Marketing ca. 3.75 credits	?	?
Business administration	Farm Management ca. 3.75 credits	?	?
Business administration	Agricultural Extension ca. 3.75 credits	?	?
Business administration	Marketing Research ca. 3.75 credits	?	?
Business administration	Consumer Behaviour and Advertising of Agricultural Products ca. 3.75 credits	?	?
Elective from a specified list - Basic Courses (13 credits in ECTS) >1 course from A + >1 course from B			
A: Biology and Chemistry	General Biochemistry 4 credits	?	?
A: Biology	Anatomy and Physiology of Animals 5 credits	?	?
A: Technology	Farm Power and Machinery 5 credits	?	?
A: Technology	Agricultural Technology 5 credits	?	?
A: Computer Science	Computer Programming 5 credits	?	?
A: Geology	Geology-Petrography 5 credits	?	?
B: Biology	General Microbiology 5 credits	?	?
B: Biology	Genetics 5 credits	?	?
B: Biology	General Zoology 5 credits	?	?
B: Technology	Agricultural Hydraulics 5 credits	?	?

Elective from a specified list – Agricultural Economics (35 credits in ECTS) >3 courses from A + >3 courses from B			
A: Computer Science	Computers and their Applications in Agricultural Economics 5 credits	?	?
A: Agricultural History	Rural Community Development 5 credits	?	?
A: Agricultural Animal Science	Special Lectures in Animal Husbandry 5 credits	?	?
A: Agricultural Science	Principles of General and Applied Pomology 4 credits	?	?
A: Technology	Agricultural Technology 5 credits	?	?
A: Agricultural Science	Special Topics on Plant Protection 5 credits	?	?
A: Economics	Prices of Agricultural Products 5 credits	?	?
A?: Business administration	Food Marketing 5 credits?	?	?
A?: Business administration	Food Industry 5 credits?	?	?
B: Methodology	Rural Sociological Research 5 credits	?	?
B: Law	Agricultural Law 5 credits	?	?
B: Economics	Policy of Agricultural Products 5 credits	?	?
B: Economics	Economics of Processing of Agricultural Products 5 credits	?	?
B: Economics	Economics of Natural Resources and Environment 4 credits	?	?
B?: Economics/ Business administration	Economics of Livestock 5 credits?		
B: Business administration	Rural Tourism 5 credits	?	?

B: Business administration	Marketing and Crops 5 credits	?	?
Individual work (83 credits in ECTS)			
Economics/ Business administration	Degree Thesis (Bachelor of Science) 15 credits	Written essay	?
Economics/ Business administration	Degree Thesis (Master of Science) 60 credits	Written essay	?
Economics/ Business administration	Practical Training 8 credits	Written paper	?