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COMPARISON OF STRATEGIES, METHODS AND CONTENT IN FORESTRY EDUCATION


An international comparative study

Bachelor's thesis


Degree Programme in Forestry



KUVAILELLEHTI

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Nimeke Metsäalan koulutuksen strategioiden, toimintojen ja sisällön vertailu		
Tiivistelmä <p>Metsätalous on kansainvälisesti monimuotoinen ala, joka on ympäri maailman sopeutunut paikallisiin ainutlaatuisiin toimintaympäristöihin. Ekosysteemiin liittyvien eroavuuksien lisäksi metsätalouden on kohdattava paikallisen lainsäädännön, teollisuuden rakenteiden, teknologian ja metsänomistajakunnan rakenteen asettamat haasteet. Tämän sopeutumisen, erikoistumisen ja ympäristön mukana kehittymisen kannalta osaavan metsäammattilaishenkilöstön kouluttaminen on ensiarvoisen tärkeää.</p> <p>Tämän tutkimuksen tarkoituksena oli havainnoida eroavuuksia suomalaisen ja pohjoisamerikkalaisen metsätalouden koulutuksen välillä. Tutkimus keskittyi metsätalouden alempaan korkeakoulututkintoon suomalaisen Mikkelin ammattikorkeakoulun ja yhdysvaltalaisen University of Idahan tarjoamina. Tutkimuksen kuluessa huomattavia eroavuuksia oli havaittavissa opetussuunnitelmien rakenteissa, metodologiassa ja opetussuunnitelmien valmisteluun liittyvissä organisaatioiminnoissa. Samankaltaisuuksia oli havaittavissa erityisesti strategisissa linjauksissa, koulutustavoitteissa ja organisaatiomalleissa.</p>		
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DESCRIPTION

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Abstract <p>The art of forestry is a globally diversified set of practices. Although ecosystems within the temperate region may be similar to some degree, such factors as legislation, industrial trends and traditions, technological progress, and the structure of land ownership can vary considerably between and even within countries. Thus forestry is required to not only to match the local ecosystem but also the legislative and socio-economical challenges. The education of forestry personnel is a key factor in this process of adaptation and progress along with the operative environment.</p> <p>The purpose of this comparative study was to observe differences between Finnish and North American forestry education. More specifically, this study focused on the Bachelor of Science-level university education in forestry as it is offered by the Mikkeli University of Applied Sciences, Finland, and the University of Idaho, United States. Over the course of the study significant differences were observed in the curriculum structures, methodology, and organizational processes relative to curricular revision. Similarities were found especially in strategic outlines, educational goals, and organizational structures.</p>		
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1 INTRODUCTION

Forestry is a major global trade with a highly variable field of operation depending on each country where it is practiced. As forestry focuses on trees and the biological environments in which they exist, its operational methods, education and professional culture are greatly affected by the local ecosystem, geography and culture. Thus forestry is a highly segregated and specialized type of industry as each country has evolved its own specific practices and methods. Although common standards have been invented and adapted as globalization has brought international demands onto each geographical area of forest operations, forestry has retained its very diverse nature in the methodology of industry, science and education.

The evolution of local forestry practices is mainly governed by factors related to its immediate environment. The structure of the local ecosystem is perhaps the biggest single factor from which legislation and local attitudes towards forestry partly stem from. If the industrial aspect of forestry is considered, much of the necessary methodology is defined by the species of trees available for utilization. The requirements of different species on their optimal growing environment and management practices can be highly variable, as well as the mechanical properties of their wood. The conservational status of different species and their habitats may also be a significant issue, the nature of which is highly dependent on the region. One must also consider the effects of the local physical environments: geography, possible rain seasons, temperatures throughout the year, and other aspects of local weather, among others. The local legislation, especially natural conservation laws, and the division of land ownership may greatly vary between countries, which combined with the types of interest of land owners towards different aspects of forestry largely defines the nature of the local forestry practices.

For example in the United States the shift of interest among the forest land owners has been undermining the traditionally heavily industrial-focused forestry. According to the Idaho Forest Products Commission (Idaho Forest Products Commission 2010) 79% of the timberland in the state of Idaho was under the administration of the federal United States Department of Agriculture (USDA) Forest Service, while only 15% was owned by private sector companies and persons. However in 2007 of all the 2 690 400 cubic meters of wood that was harvested in Idaho about 1 770 000 cubic meters, that is roughly two thirds, originated from timberlands owned by private sector parties (Brandt, et al. 2008). Of the remaining portion only one quarter was harvested from timberlands under the administration of the USDA Forest Service and the remaining three quarters from timberlands owned by the state of Idaho. As the housing market crisis began to lower the prices of timber products, the production chain was immediately affected. The resulting downturn of wood harvesting could be observed in all classes of forest ownership (Brandt, et al. 2008). According to Penttinen (2008) a rising interest in non-industrial, recreational focused forest usage has been spreading among the American forest owners, which may before long result in a significant change in the methodology and focus of forestry in North America.

The purpose of this thesis was to observe and study the differences between the United States and Finland in the field of forestry by comparing the Bachelor's level academic forestry education in the University of Idaho (UI), Idaho, United States, and the Mikkeli University of Applied Sciences (MAMK), Finland. The University of Idaho Bachelor of science (B.S.) degrees included in the comparison were B.S. in Forest Products and B.S. in Forest Resources, both offered by the UI College of Natural Resources. The Mikkeli University of Applied Sciences degree involved in the study was the B.S. in Forestry offered by its Department of Forestry.

2 STUDY BACKGROUND

Within the last 25 years the phenomenon of globalization has been progressing at a rapid rate. Although it is commonly considered to have started already in the 20th century, it was not until only recently that the accelerated development and distribution of information networks such as the internet started making the world truly smaller. With the development of language education and increased competence in intercultural communication the globalization could proceed and accelerate. (Schifferes, 2007; Nunn, 2005.)

It is because of the globalization of economies that the mobility of human resources and knowledge has increased. As a result, the competition over expertise has tightened, and the field of forestry is of no exception. In this competition a critical factor to success is the academic competence – possession of a highly esteemed and internationally competent system of higher education institutions. To advance towards this goal the Ministers of Education of the European Union have accepted three strategic objectives, following a mandate from the Lisbon meeting of the European Council in 2000. According to the report composed by the EU Educational Council (Council of European Union 2001) these objectives are: “increasing the quality and effectiveness of education and training system in the European Union”, “facilitating the access of all to the education and training systems”, and “opening up education and training systems to the wider world”. (ARENE Ry 2007; Council of European Union 2001)

To expand the possibilities of their local industries the institutions offering forestry education have introduced international programs to gain and share knowledge as well as attract interest in their services and technology. For instance, North American University of Idaho College of Natural Resources lists ”GOAL 2: Prepare all CNR students for a global workplace.” with several strategies and objectives in its Strategic Working Document 2008 Teaching and Learning Goals (University of Idaho College of Natural Resources 2008). In a similar fashion Finnish Mikkeli University of Applied Sciences states in its Study Guide 2005-2006 (Koulutustiimi, et al. 2005) under Operating Idea and Val-

ues that "Mikkeli Polytechnic educates venturous, entrepreneurial, and internationally oriented experts in all its fields of study."

3 UNIVERSITIES, DEPARTMENTS AND DEGREES

3.1 A brief introduction of the universities

Founded in 1889, University of Idaho (UI) is the primary university and the oldest public university in the US state of Idaho. Its main campus is located in the city of Moscow, Northwest Idaho and also has smaller campuses found in Boise, Coeur d'Alene, Idaho Falls and Twin Falls. The university has about 12 000 students and is composed of ten colleges, each of which is composed of Departments that offer degree education, conduct research, and participate in outreach activity. Degrees in the field of forestry are offered by the College of Natural Resources (CNR) primarily by two of its departments: The Department of Forest Products and the Department of Forest Resources. Both departments offer degrees on Bachelor's of Science (B.Sc), Master of Science (M.Sc) and Doctor of Philosophy (Ph.D) levels. According to its statement of Vision, Values and Directions (University of Idaho Provost 2005) the University of Idaho values itself as "an internationally recognized land-grant institution combining research, graduate, and professional education with a strong undergraduate base in the liberal arts and sciences.". (University of Idaho 2010a)

The Mikkeli University of Applied Sciences (Mikkelin Ammattikorkeakoulu, MAMK) is a Finnish university of applied sciences, formerly known as a polytechnic, situated in the city of Mikkeli, Eastern Finland. The university has auxiliary campuses in Savonlinna and Pieksämäki. The student attendance was 4 500 as of 2009. The Degree Programme in Forestry is located in the Nikkarila campus in Pieksämäki and offers B.S. in Forestry. As of 2008 an M.Sc Degree Programme was also introduced for applicants with post-

graduate work experience in the field of forestry. However this programme is not available to any other applicants. The Mikkeli University of Applied Sciences profiles itself as an institution of life-long learning with a strong emphasis on operations and expertise in Russia, and in its results remaining among the top three Universities of Applied Sciences in Finland. (Mikkeli University of Applied Sciences 2009; Mikkeli University of Applied Sciences 2010)

3.2 Materials and methods

The study was conducted using materials composed by the universities, their divisions, colleges, and departments. No third-party documents were used aside from providing necessary clarification to common standards and practices described but not elaborated by the official university documents. Publicly available materials were used as much as it was possible; largely online content found on the university websites, and study catalogs. In addition, self-study reports composed by the UI departments were used to great extent for gaining an understanding on departmental functions, goals and organization. These reports were requested from the heads of the respective departments in Spring 2008. Before the study was conducted, the validity and up-to-date nature of these reports were confirmed. The curricular content itself as described in these documents were not used; they were replaced by the latest curricula as available on the websites of the UI departments. In brief, the curricular content and degree descriptions of the UI departments were evaluated based on the latest information published on their websites, while the description of organizational structure and processes was based on the self-study reports obtained in 2008. Strategic action plan documents published by the University of Idaho Provost and the College of Natural Resources were utilized for the Strategies and Goals evaluation.

The MAMK Department of Forestry was evaluated using a similar principle. Up-to-date publicly available materials were used as much as it was possible. The primary source of

information was the MAMK Study Guide 09/10. Nearly all information on MAMK that was used in this study was based on this document. The description of the curriculum process was based on a handout intended for internal briefing of the MAMK departments, acquired in fall 2008. Information on the Department of Forestry organizational model and internal functions was acquired through an interview with the department head, conducted on the 15th of April 2010. The MAMK strategic plan documents were largely classified. As such, information on the strategic development was limited to what was found in the publicly available Mikkeli University of Applied Sciences Development Plan 2010-2015 (Mikkeli University of Applied Sciences 2010a).

The study was conducted as a comparative analysis with the aim to provide all involved departments with information on each other and what are the key differences in their operational methods, strategies and curricula. The primary concern were the differences that exist between the MAMK and UI departments, with less focus on how the UI departments and degree options differ from each other. The Universities, Departments and Degrees section is to provide an overview of each department and degree, their organizational models, curricular processes, and educational content of their B.S. level degrees.

In the following Comparison section the differences of between the universities, departments and degrees are examined category by category. As the manner by which the departments divide their degree structure into different categories differs greatly both between and within the universities, a set of common comparable categories were established. These categories were selected and titled so that all curricular modules from each degree could be classified into them for effective comparison. These categories are: Common/Core Studies, Required Degree Studies, Restrictive Elective Studies and Free Elective Studies. Differences in how the departments focus their degrees were examined by observing the difference in credit significance of these categories. This was essentially numerical analysis, in which it was observed how the degree credits were divided into these categories in each degree. The differences in organizational models and functions

were examined by formulating charts illustrating these structures, and analyzing the description of functions and processes in the materials mentioned above. Lastly, in the Conclusion section the key differences were identified, their nature analyzed and questions formulated during the comparison process were answered.

As the American and European universities utilize different standards for study credits, it was necessary to find a way to convert between these systems, and define a common standard to make comparison results viable. The University of Idaho measures the students' educational attainment using the American Carnegie Unit system established by the Carnegie Foundation for the Advancement of Teaching. As a European institution of higher education, the Mikkeli University of Applied Sciences uses the European Credit Transfer and Accumulation System (ECTS) (Mikkeli University of Applied Sciences 2009). For conversion between these two the University of Idaho follows the recommendations from the National Council on the Evaluation of Foreign Academic Credentials, as stated in the equivalencies FAQ of the UI Graduate Admissions website (University of Idaho Graduate Admissions 2010): "One ECTS credit is comparable to one half (.50) semester credit [.75 quarter credit] at a regionally accredited post-secondary institution in the United States". In essence, one Carnegie Unit standard credit corresponds two ECTS standard credits. Thus the standard B.S. credit depth of 128 used by the University of Idaho becomes 256 credits on ECTS scale, roughly similar to the 240 ECTS standard B.S. degrees offered by the MAMK. This rate of conversion was utilized in this study. In the comparison section that measures the credit division differences, and in other such sections where it was necessary, the ECTS system was used as a common standard.

3.3 Mikkeli University of Applied Sciences, Department of Forestry, Degree in Forestry

The Mikkeli University of Applied Sciences (MAMK) Department of Forestry offers higher education in the field of forestry with its Degree Programme in Forestry. This B.S.

degree is 240 ECTS credits in depth and is typically taken in four years. The credits in all B.S. degrees administered by MAMK are divided between six modules (chart 1.): common studies, basic studies, professional studies, optional studies, practical training and bachelor's thesis. (Mikkeli University of Applied Sciences 2009)

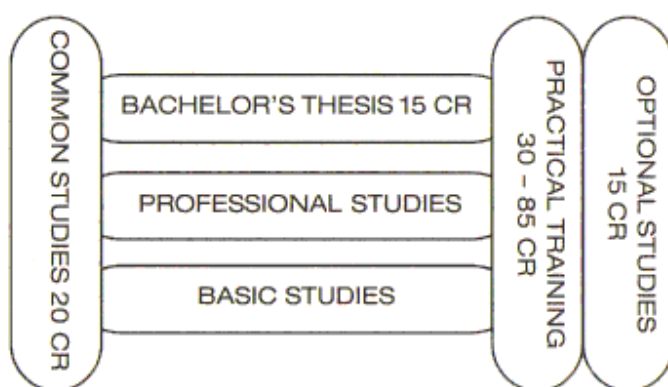


CHART 1. Structure of the MAMK polytechnic Bachelor's degree (Mikkeli University of Applied Sciences 2009).

In the 2009 edition of the MAMK Study Guide the educational objective of the Department is described as "to educate forestry professionals whose work can include planning, marketing, development and expert tasks in forest management and wood procurement.". Furthermore, graduates are expected to be able to work as independent entrepreneurs. The learning outcomes are defined separately for each academic year. On their first year students are to learn the basics of forest ecology, measurement methods and equipment, basic forestry, and essential technology. During the second year essential knowledge in forest management, planning, procurement and silvicultural practices are added, as well as education in the socio-economic factors related to forestry. On the third year students begin their optional professional studies towards their own desired specialization and strengthen their understanding on the structure of the field of forestry. They will also engage in summer traineeship before the final year. The final year is dedicated to applying

the knowledge and skills in practice, partly in the form of the Bachelor's thesis. (Mikkeli University of Applied Sciences 2009)

The department is administered by a department head (Koulutusjohtaja), whose tasks include the administration of the faculty and staff, economy, and the execution of educational strategies. MAMK used to consist of six divisions, roughly equivalent to the UI Colleges, but these were recently eliminated and now all MAMK department heads report directly to the University Rector. In addition to the administrative duties the head participates in educational and outreach activities along with the other department faculty. In addition to teaching, the head carries out commercial services such as consultation. The head of the Department of Forestry is also responsible for Practical training, which is required from all B.S. students. The Head participates in a bi-monthly departmental faculty meeting where operative issues concerning the department are discussed. The department also holds bi-annual Development seminars where strategic issues such as curricular revision are discussed (Chart 2). (Mäntylä 2010)

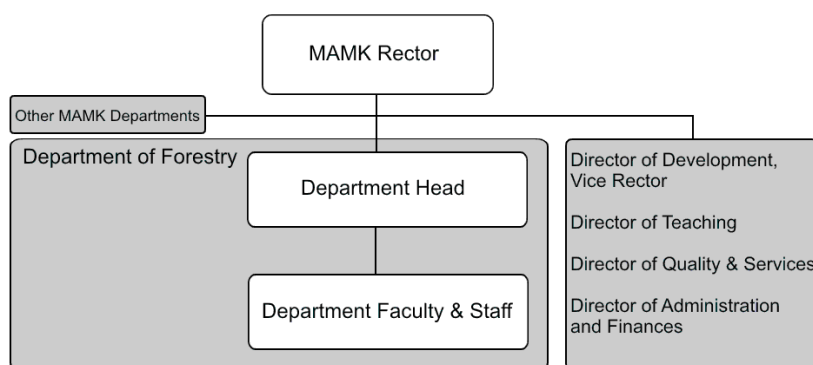


CHART 2. The organizational structure of the MAMK Department of Forestry (Mikkeli University of Applied Sciences 2009; Mäntylä 2010).

The Departments of the MAMK revise their curricula on annual basis in a collective process. The needs for curriculum changes are defined at an annual seminar, during which an analysis on the base skill requirements is conducted. This document is to determine what requirements are placed on the educational services of the University and its graduates, thus paving the way to any necessary curriculum changes. In the next step workgroups consisting of experts and students are formed for all MAMK divisions and departments. These workgroups produce common teaching modules for their respective divisions and departments. The MAMK Executive Board then confirms the new curricular structures for all divisions and prepares the new course syllabi. The educational structures of the departments are prepared based on the decisions made earlier during the process, and then course syllabi are finalized. After this the Executive Board approves the revised curricula, which are then published in the next edition of the Study Guide. During the process each department composes a core base skill analysis which acts on a basis for the curricular revisions. Departments independently define their educational objectives, learning outcomes and the areas of competence for which their education aims to prepare the students for. Each department must fit a general core module into its curriculum, which serves a similar purpose as the UI General Core and contains a set of basic courses required for all departments within the MAMK. Departments may place the general core module courses into the curricula using their own discretion, as long as all required courses are in place. After the curricular changes have been approved, they will be uploaded into the university's network course and resource management system that is accessible by both students and faculty. The heads of each department appoint a faculty member to approve the uploaded courses. (Hytönen 2006)

TABLE 1. Division of credits between curriculum modules in MAMK Dept. of Forestry. Note differences to the general MAMK B.S. degree outline in CHART 1 (Mikkeli University of Applied Sciences 2009).

<i>Curriculum module</i>	<i>Credit total</i>
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Basic studies	46
Compulsory professional studies	104
Optional professional studies	30
Optional studies	15
Practical training	30
Bachelor's thesis	15

The Department's Bachelor of Forestry is 240 ECTS credits in depth and four years in length. The Department has divided the curriculum into six modules following the basic MAMK degree outline with some modifications (table 1). These modules are: basic studies, compulsory professional studies, optional professional studies, optional studies, practical training and bachelor's thesis. Basic studies and compulsory professional studies are strongly focused on the first two years of study with less courses assigned to the third and fourth years. The Basic studies courses involve IT and communication, methodological studies and studies related to working and business life, and are compulsory to all students. It also contains the MAMK Common studies cluster, which constitutes nearly half of the Basic studies module. The compulsory professional studies are a similar module, required of all students regardless of their specialization. This module incorporates basic studies in forestry, wood procurement, the forest environment and forest planning. (Mikkeli University of Applied Sciences 2009)

TABLE 2. Structure of Optional professional studies Sub-modules (Mikkeli University of Applied Sciences 2009).

<i>Optional Professional Studies Cluster</i>	<i>Credit division</i>
Marketing and Communication in Forestry	15
Marketing and Sales Promotion	5
Import and Export in Forest Cluster	5
Proficient in Communication in Different Contexts	5
Private Forestry	15

GIS Analysis	5
Themed Studies in Silviculture	5
Private Forestry	5
Applications in Wood Procurement	15
Practical Training with Forest Machines and Quality of Logging	5
Administration of Computer Systems	5
Logistics of Wood Procurement	5
International Forestry	15
Forestry and Forest Management	5
International Mobility	10

Optional professional studies module is divided into five clusters, each offering a different set of courses and being 15 credits in depth (table 2). These modules are Marketing and Communication Planning, Private Forestry, Applications in Wood Procurement and International Forestry. Each student must select two of these modules to be included in his or her personal curriculum as specialization studies. These studies begin on the first semester of the third year of study and end by second semester of the final year. The optional studies module allows students to pick additional courses from all the optional professional studies clusters, or from any other degree programme offered by the MAMK, another university, or polytechnic institute in Finland or abroad, as long as the selected studies are deemed suitable for the Degree in Forestry. Essentially the optional studies module correspond to the UI Free Elective studies. (Mikkeli University of Applied Sciences 2009)

Credit structure of B.S. in Forestry, MAMK

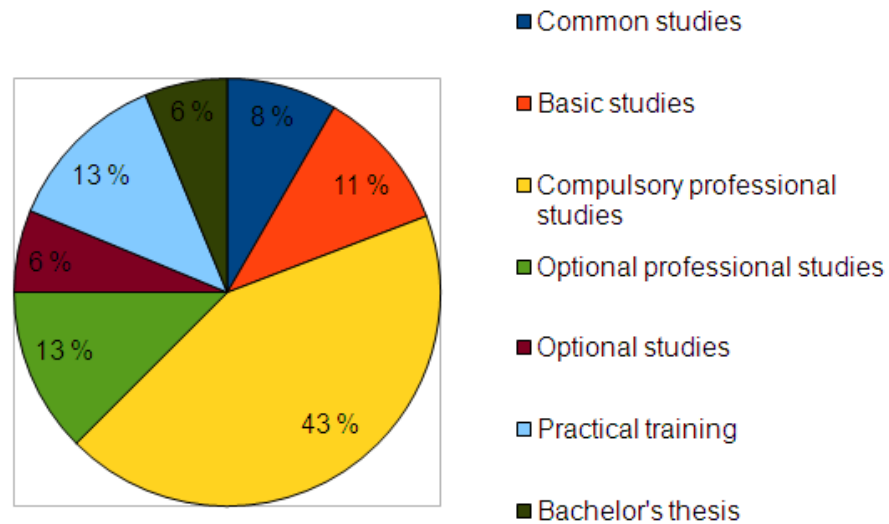


CHART 3. Division of credits between curriculum components in the MAMK B.S. in Forestry Degree (Mikkeli University of Applied Sciences 2009).

The practical training module aims to familiarize students with the working life and professional positions they will hold after graduation. According to Study Guide 09/10 (Mikkeli University of Applied Sciences 2009), the practical training "aims at familiarizing students with practical tasks vital to their professional studies and giving them the opportunity to apply their knowledge and skills in working life.". Practical training is carried out under a private employer or governmental organization with some supervision from the MAMK. Each department has a faculty member assigned to handling matters related to practical training of its students. In the Department of Forestry this position is held by the department head (Mäntylä 2010). A student may also carry out practical training abroad via MAMK's partner networks such as IAESTE, Leonardo Socrates, EU-US, Nordplus and individual partners in the Baltic countries, Russia, USA, the Far East and South America. (Mikkeli University of Applied Sciences 2009)

The final part of studies at MAMK is largely devoted to the Bachelor's thesis. The thesis is intended to have the students "show their abilities in implementing their theoretical knowledge to a practical problem." (Mikkeli University of Applied Sciences 2009). The thesis is often carried out as commissioned work for a third party such as a forestry company and is designed to encourage students to use their skills and knowledge acquired over the course of their studies to carry out an in-depth project on a subject relative to their field of specialization. The thesis may be carried out individually or in groups, and each thesis has an academic advisor assigned from the department faculty. After the thesis draft has been completed, it is submitted to the advisor and reviewed by at least one other faculty member. Reviewers provide commentary on the draft, and propose changes and correction. Final evaluation will take place after the thesis has been submitted, reported and presented. As a final step, a Maturity Test will be conducted after the evaluation. The purpose of this test is to measure the linguistic competence of a student in the field of his or her Bachelor's thesis. Writing the Maturity Test is compulsory for all students. (Mikkeli University of Applied Sciences 2009)

3.4 The University of Idaho, Department of Forest Resources, B.S. in Forest Resources

The Department of Forest Resources is the largest department in the UI College of Natural Resources. The department offers three degree options, of which B.S. in Forest Resources is within the scope of this study. This degree can be continued to M.S. and Ph.D. In accordance to the UI and American educational standards, the programme is 128 credits in depth and is normally four years in length. The Department aims to equip its students with the necessary competence for a career in natural resource science and management. In the report for re-accreditation (Department of Natural Resources 2006) its vision is stated as "[...] to be widely recognized as leaders in education and research to advance understanding and management of forest ecosystems" and its mission divided into three main categories. The first of these is the educational mission which mentions knowledge in local tree species, variability of sites, spatial analysis and utilization of

modern data processing tools as some of the skill highlights for its graduates whom are expected to work as forest managers and scientists. The other two mission categories are research and outreach; as a part of a research university, the department strives to produce scientific data, which is published in refereed journals and literature. The outreach/service category consists of raising public awareness and knowledge in key issues surrounding forests and the ecosystem by publishing research results and knowledge in journals and disseminating them to other media. (Department of Forest Resources 2006)

According to its re-accreditation report (Department of Forest Resources 2006) the instructional goal the Department of Forest Resources is to "provide both undergraduate and graduate students of all nationalities with a high-quality general education and the professional knowledge of significant concepts, multiple use of principles, social factors, and technical details of forest resources biology, measurements, management, and social science to understand and effectively manage forest resources.". The department has set seven learning outcomes for the B.S. in Forest Resources programme, which act as criteria for graduating students. These are for instance the ability to "assess forest, site, and socioeconomic conditions across temporal and spatial scales using appropriate metrics", "forecast potential outcomes of forestry decisions in time and space, while considering the risks and uncertainty" and "demonstrate critical thinking and problem-solving skills" (Department of Forest Resources 2008). In addition, the department's re-accreditation report (Department of Forest Resources 2006) mentions a group of skills a graduate is expected to possess to succeed in career life, such as "an understanding of the multiple-use, interdisciplinary and global aspects of natural resource management", "the technical details to perform field operations and enhance professional competence" and "the ability to analyze the consequences of alternative management strategies in forests, other wild-land ecosystems and affected social institutions". (Department of Forest Resources 2006)

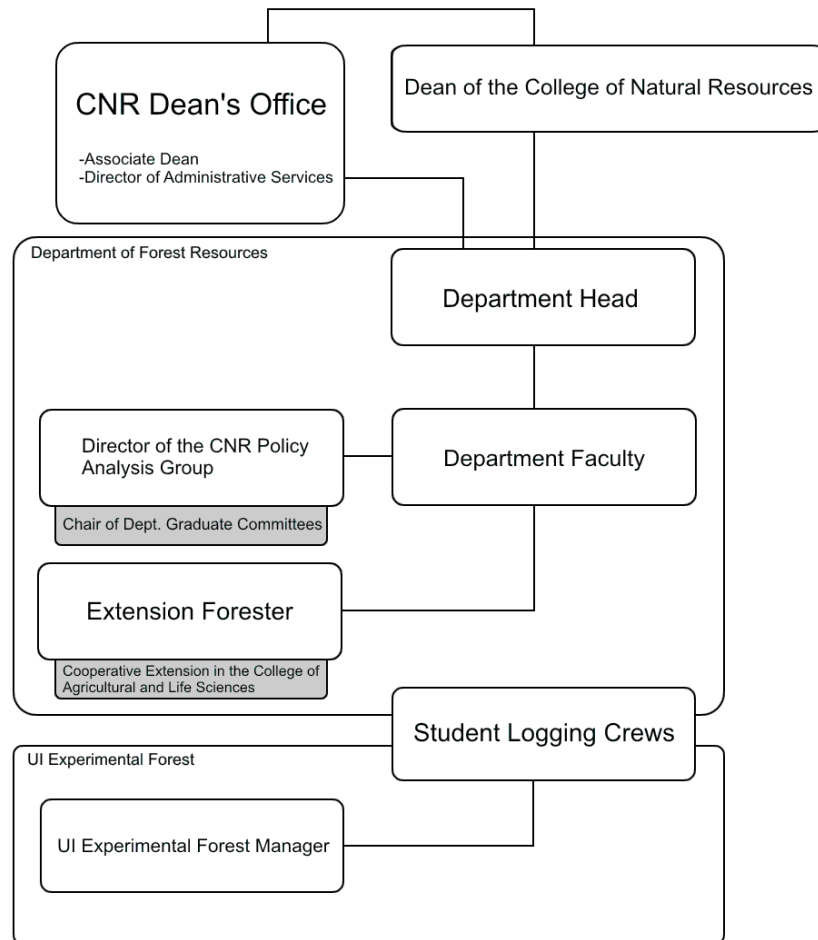


CHART 4. Organizational model of the Department of Forest Resources (Department of Forest Resources 2006).

Organization wise the Department of Forest Resources is the largest within the CNR and one of the most complex in the entire university. The department is administered by a department head who reports directly to the CNR Dean and works with the CNR Dean's Office. In addition to his/her duties as the administrator, the head also participates in teaching, research and service along with other faculty members. About 50% of the head's duties are composed of appointments while the remaining half comprises the general duties as a faculty member. The head's administrative tasks involve faculty position descriptions, annual evaluations, tenure and promotion processes, managing degree programs in

the department and participation in meetings held by the Dean and other department heads. Additionally the head is in charge of overseeing the faculty and staff in research and outreach projects. The department administration also holds tenured seats for the Director of the CNR Policy Analysis Group, who participates in graduate course teaching and chairs the Department graduate committees, and the Extension Forester (Chart 4). (Department of Forest Resources 2006)

The process of curricular revision and changes is described in this paragraph based on the Self-study Report for Re-accreditation by the Department of Forest Resources (2006). The department faculty is responsible for revision, updating, and implementation of the curricula. For comprehensive changes a 3-5 person workgroup is selected from the department faculty to evaluate the need for curriculum changes. The objective of the workgroup is to compose a document of recommendations that will be reviewed and discussed by the entire department faculty. An individual faculty member may also submit proposals for minor changes in the curriculum, which are then reviewed and discussed. After this process necessary revisions can be made to the proposition document and once it is approved by the department faculty, it will be submitted to the CNR Curriculum Committee. In addition to reviewing the document by itself, the Committee will post it to all of the CNR faculty for review. If the Committee approves the document, it is forwarded to the University Curriculum Committee (UCC) to which it is presented by the department head or another faculty member. If approved by the UCC, the document of changes is posted for review to all of UI faculty for five days. After the UCC receives the final approval, the document is forwarded to the Faculty Council and then for final approvals by the Provost and the State Board of Education (SBOE). Approved changes are added to the latest UI Catalog, published every spring. Individual courses are updated on an annual basis individually and free of this process by the responsible faculty to maintain their teaching effectiveness. These changes are posted for public peer evaluation by students and faculty, being commonly available at the Department Office and often on the course websites.

TABLE 3. Major components of the B.S. Forest Resources curriculum (University of Idaho Office of the Registrar 2009).

<i>FORRES Curriculum Module</i>	<i>Total Number of Credits</i>
UI Core Curriculum	50
Required Forest Resources Curriculum	44
Required Restrictive Electives	16
Free Electives	18
UI Minimum Required TOTAL	128

The B.S. in Forest Resources programme requires the student to complete 128 credits of studies with the minimum Grade Point Average (GPA) of 2.0. The curriculum can be broken down to four components, as illustrated in table 3 and chart 5. These are: UI Core Curriculum, Required Forest Resources Curriculum, Required Restrictive Electives and Free Electives (Department of Forest Resources 2006). The most significant of these is the UI Core Curriculum, which consists of General Core Studies, Communication, Natural and Applied Sciences and Mathematical, Computer and Statistical Sciences. The Core Curriculum is designed to form the knowledge basis for professional studies. Each of its components is composed of selectable clusters which allow students to define the basis of their own academic education. The heart of the Core Curriculum, the General Core Studies, consists of CORE Discovery, Humanities, Social Sciences and International Course (University of Idaho 2007). In addition, students at CNR are required to take the NR 101 Exploring Natural Resources course on their freshman year. This course is interdisciplinary and shared by all CNR departments (University of Idaho College of Natural Resources 2010).

Credit structure of the B.S. Forest Resources Degree

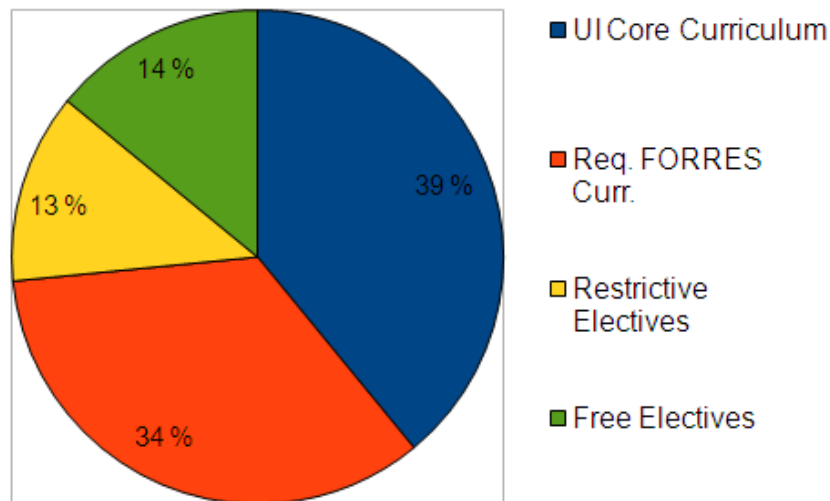


CHART 5. Division of credits between curriculum components in the UI B.S. in Forest Resources Degree (University of Idaho Office of the Registrar 2009).

The remaining 68 credits are divided between the Required Forest Resources Curriculum, Restricted Electives and Free Electives. The Forest Resources Curriculum is 44 credits in depth and comprises of the required courses of professional Forest Resources education, and are almost entirely taught by the department faculty. The Restrictive Electives consist of 16 credits of courses chosen from a 33 credit list of courses from all CNR departments and some others from the College of Science, the College of Agricultural and Life Sciences, the College of Engineering and the College of Letters, Arts and Social Sciences. The remaining 18 credits are dedicated to Free Electives which may be selected from any courses offered by the UI. Each student has an academic advisor assigned from the department faculty, whose purpose is to advise students in selecting electives and clusters that best support their interests and skills. The advisors often use so called career tracks and checklists provided with the curriculum to find the optimal courses for each student

regarding his or her interests and skills. (Department of Forest Resources 2006)

3.5 The University of Idaho, Department of Forest Products, B.S. in Forest Products

The Department of Forest Products is a UI CNR Department specialized in industrial forestry and its products, wood properties, production processes of both raw material and final products, as well as the economic aspects of the forest product industry (Department of Forest Products 2010). It offers its degree programme in Forest Products on B.S., M.S. and Ph.D levels and according to the University of Idaho website (Department of Forest Products 2010) is "the largest accredited forest products program in the nation". The department has specified objectives for three aspects of its operation: teaching, research and continuing education (Department of Forest Products 2004).

In the Undergraduate Programs Self-Study Report (Department of Forest Products 2004) the education objectives of the department are defined "to: 1) produce technically competent and educated graduates who can contribute to society, 2) produce potential employees for the forest products industry, and 3) provide training in timber harvesting and forest products to people outside the forest products field". Moreover, the department has defined five learning outcomes, which its graduates are expected to meet. These (APPENDIX 2) include "a sufficient academic background in forest products and allied disciplines for entry level employment within the forest products and allied industries or for transition to a forest products graduate program", "critical thinking, problem solving, and lifelong learning skills necessary to find solutions to forest products problems" and "ability to work with teams and provide leadership to integrated groups of individuals focused toward a common goal".

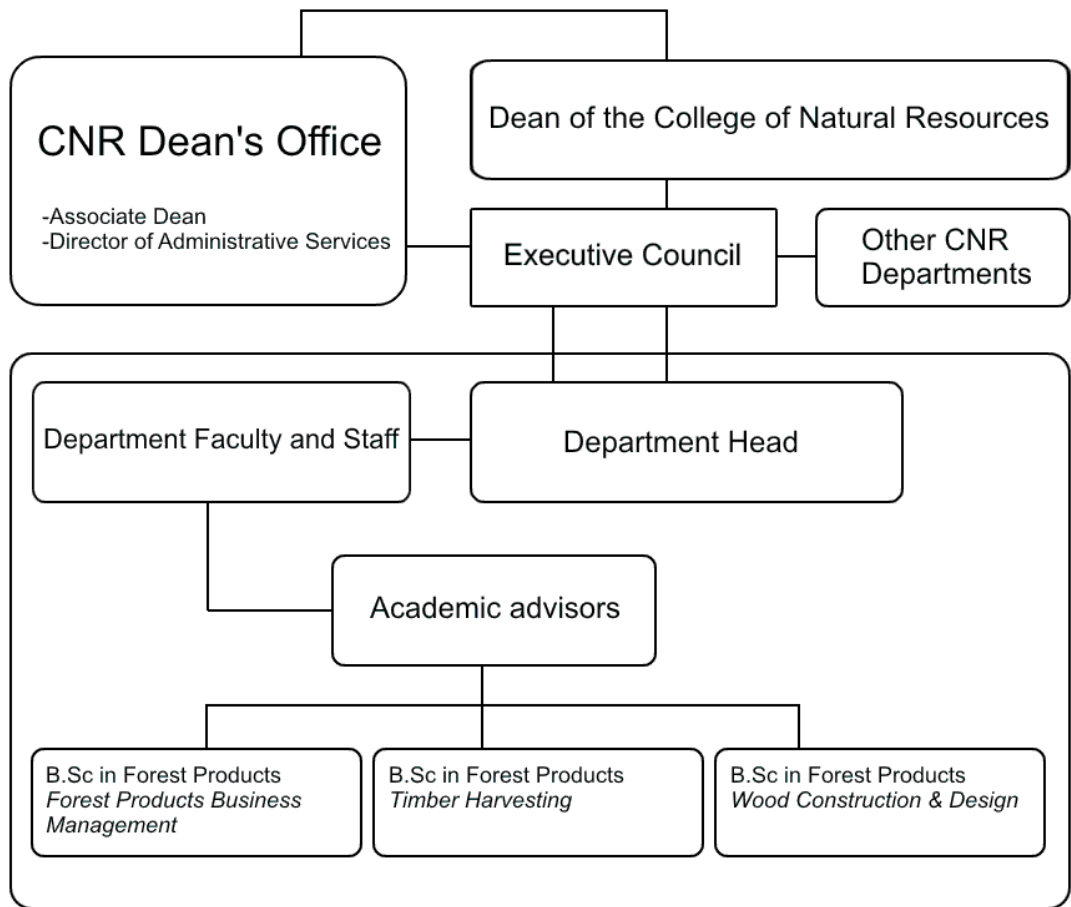


CHART 6. Organizational model of the Department of Forest Products (Department of Forest Products 2004).

The organizational model of the Department is quite similar to that of the Department of Forest Resources. The Department is administered by a department head who represents the Department in the CNR Executive Council meetings and reports directly to the Dean of the CNR. In addition to administration duties the head participates in teaching and research along with other faculty members. Each of the three degree options of the Forest Products degree is overseen by one or more faculty members assigned as academic advisors. Their task is to ensure that the curriculum of each option is up-to-date and effective. The advisors evaluate the curricula on an ongoing basis and when changes are deemed necessary, the advisors present them at a departmental faculty meeting. These meetings

are typically organized on a monthly basis, or as needed. If proposed changes are approved, they are submitted for consideration by the College Curriculum Committee. From this point onward the curriculum revision process proceeds in similar fashion as previously described under the Department of Forest Resources (Chart 6). (Department of Forest Products 2004)

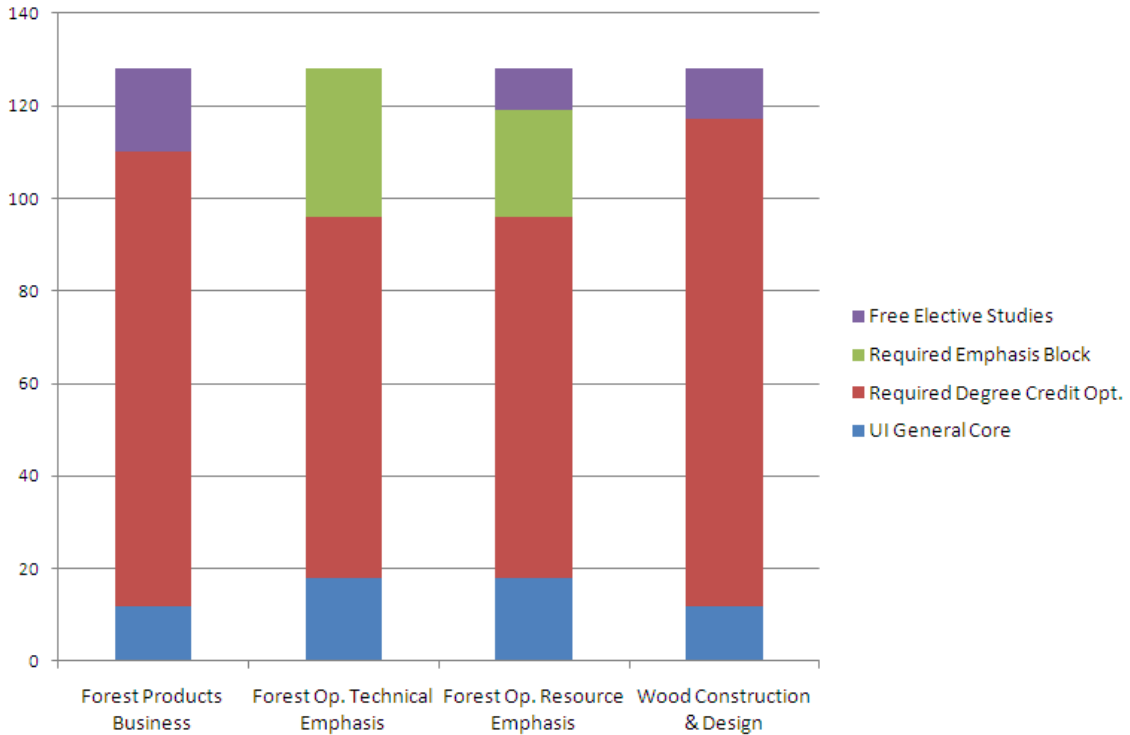


CHART 7. Division of credits between curriculum components in the UI B.S. in Forest Products Degree options.

The Department's B.S. Degree in Forest Products is 128 credits in depth and is divided into three degree options: Forest Products Business Management, Forest Operations and Wood Construction and Design. Furthermore, the Forest Operations option is divided into two areas of emphasis: Technical emphasis and Resource emphasis. The curriculum of B.S. in Forest Products is thus largely dependent on the selected degree option and the field of emphasis. All degree option studies are normally four years in length. The credit structure of the Forest Products degree with all its options and emphases is rather com-

plex, as illustrated in table 4 and chart 7. (Department of Forest Products 2010)

TABLE 4. The credit structure of Forest Products degree options.

Forest Products Degree Option	UI Core	General	Required Degree Credit Opt.	Required Emphasis Block	Free Elective Studies
Forest Products Business	12		98 – 100		16 – 18
Forest Operations					
<i>Technical Emphasis</i>	18		78	32	0
<i>Resource Emphasis</i>	18		78	23 – 24	8 – 9
Wood Construction & Design	12		105		11

According to the department website (Department of Forest Products 2010c) Forest Products Business option is designed to provide students with "knowledge and skills to qualify for well-paying positions in the business side of forest products, production management, marketing and distribution, and technical and support services.". The curriculum consists of studies in the technical aspect of forest products, such as their manufacturing, processing, drying, and preservation, combined with business studies in management, economics, marketing, finance, and product development. The degree option credits sum up to 100 and the remaining 28 credits are divided between University General Core (12 credits) and Free Elective Studies (16 credits). (Department of Forest Products 2009a; Department of Forest Products 2010c)

The Forest Operations option emphasizes knowledge in timber harvesting operations. Ac-

According to its website (Department of Forest Products 2010a) the students are taught necessary skills and knowledge to "access, harvest, and transport trees from the woods to a process point - a mill or factory - including forest, timber sales, supervising logging crews, designing and laying out roads, and managing logging and wood procurement operations". The curriculum contains basic studies in mathematics, biology and engineering, combined with upper level courses in forest and logistics operations. In addition, students may choose from two areas of emphasis in their studies: Technical or Resource emphasis. Each of these emphases has its own requirement block of courses which is added to the curriculum of the student. The Technical emphasis adds courses in engineering science and upper-level courses civil engineering. The emphasis focuses on the mechanical and technological aspects of forest harvesting. Technical emphasis students may also extend their studies by an additional year to gain another degree in civil or agricultural engineering. The Resource emphasis places less focus on the mechanics of harvesting processes and combines harvesting with upper-level courses in forestry and forest management. The required courses include studies in botany, plant pathology, forest regeneration, administration and management, and forest ecosystems. The Resource emphasis also allows students to gain an academic minor in Forest Resources or Fire Ecology and Management. This 128 credit degree option consists of 78 credits of common studies, 18 credits of the University General Core, 32 or 23-24 credits of required emphasis studies (32 for Technical, 23-24 for Resource emphasis) and 8-9 credits of free electives (only for Resource emphasis, 0 for Technical). (Department of Forest Products 2009b; Department of Forest Products 2010a)

The Wood Construction and Design option instructs students in architecture, construction and wood engineering. According to its website (Department of Forest Products 2010d) curriculum is designed to provide "the architectural training and business technology for supervisory and managerial positions in the construction industry". The coursework comprises architectural design of buildings, construction technology and the properties and utilization of wood components. These studies are to prepare the graduates for managing and supervisory positions in the wood construction, and building and component design

industry. The Wood Construction and Design option consists of 128 credit, divided between University General Core (12 credits), Required Degree Credit Option (105 credits) and Free Electives (11 credits). (Department of Forest Products 2009c; Department of Forest Products 2010d)

4 COMPARISON

Before the comparison of individual degrees and departments it is necessary to understand the strategic goals and development objectives of both universities. Also, both universities have determined common studies all students must complete regardless of their degree. Before comparing the professional education curricula, it is necessary to examine the difference between these common education curricula.

4.1 Strategies and outcomes

The strategic planning of the Mikkeli University of Applied Sciences is largely described in the publicly available MAMK Development Plan (Mikkeli University of Applied Sciences 2010a). The strategic leading of the university is divided into three primary processes, which are Education, Research, Development and Innovation Activity (R&DA), and Commercial Services. The university has defined five fields which are deemed critical to its success: operation as a part of a larger academic complement, improving the attractiveness of the educational services, globalizing the research and development operation and expanding its base of funding, strengthening and heralding the expertise in Russia, and expanding commercial services. The university has taken the title of an institute of life-long learning and has great focus on operations in Russia, specifically within the metropolitan area of St. Petersburg. (Mikkeli University of Applied Sciences 2010a)

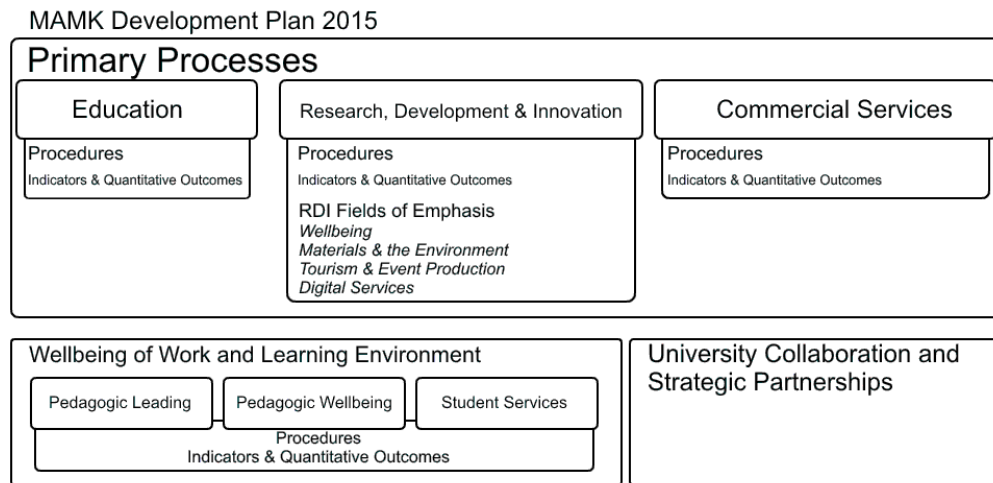


CHART 8. Illustration of the structure of the Mikkeli University of Applied Sciences Development Plan 2010-2015 (Mikkeli University of Applied Sciences 2010a).

The three categories, called Primary processes, contain the bulk of the MAMK development and strategic plan (chart 8). The first, and in the scope of this study the most significant, is the Education. The key outcomes for education are listed as "attractive education, high graduation rate, graduation within the standard time, and high rate of post-graduation employment." (Mikkeli University of Applied Sciences 2010a). Six procedures have been defined to meet these outcomes: "constant development of student recruitment", "strengthening the profile of Degree Programmes", developing "education systematically predicting changes in the field and business life", boosting "national and international networking cooperation", strengthening strategic partnerships, and increasing "courses taught in foreign language, and student, teacher, and researcher exchange." (Mikkeli University of Applied Sciences 2010a). The success in these procedures is measured against quantitative goals defined in TASO 2010-2012 agreement, and monitored in the result cards of the MAMK departments, by sector of education and on Degree Programme level. (Mikkeli University of Applied Sciences 2010a)

Related to the Primary process of Education is another section of the development plan

that is not included in the Primary processes. Titled the Wellbeing of Work and Learning Environment, this section comprises of three categories. The first of these is Pedagogic Learning, which is aimed to promote quality learning and teaching, their development, integration of R&D activity into the education, and the wellbeing of the studying environment. Lifelong learning, accountability, and investigative and critical hold are listed as some of its key principles. Strategies outlined in Pedagogic Learning include the "promotion of the spread of good pedagogic practices developed within Degree Programmes onto the university level", "strengthen ethically sustainable community action and constant learning of students, faculty, and the entire organization" and "evaluate and improve the quality of operation on an ongoing basis" (Mikkeli University of Applied Sciences 2010a). The second category is Pedagogic Wellbeing, aimed to ensure the physical and mental wellbeing of the students with counselling, advising and promoting healthy lifestyle and life control. Key factors in evaluating success in this category are entry queries for freshman students and the education development queries typically conducted for third year students. The third category is titled Student Services, aimed to improve the support functions offered to students by the university. The strategies in this category mostly focus on improving partnership networks and administrative functions to promote sharing and cooperative development of student support services between universities. (Mikkeli University of Applied Sciences 2010a)

Another of the Primary processes is the Research, Development and Innovation Activity. This aspect of the MAMK operations is aimed to carry out research and development in the field of applied sciences that serves the interests of education and supports the development of the local community and business life. In regard to education, the goal is that the "research and development activity supports teaching and learning, and vice versa." (Mikkeli University of Applied Sciences 2010a). The annual turnover of the R&D activity is aimed to reach at least 7 million euros, of which an increased portion comes from the funding applied from the European Union. The university has defined four fields of emphasis for the R&D activity: Wellbeing, Materials and the environment, Tourism and event production, and Digital services. Each field has a number of expertise clusters, the

goal of which is to "increase the recognizability, prestige, internationality of the R&D activity" (Mikkeli University of Applied Sciences 2010a). Lastly, the Commercial Services process utilizes the MAMK resources, faculty, students and facilities to produce private sector services. These services may evolve into individual private businesses. This also includes commercialization of the expertise from the R&D activity. The process also includes the MAMK Russian services division that assists Russian companies in expanding to Finland, as well as Finnish companies operating in Russia. (Mikkeli University of Applied Sciences 2010a)



CHART 9. Structure of the UI Strategic Action Plan 2005-2010 (University of Idaho Provost 2005).

The University of Idaho has composed a Strategic Action Plan (University of Idaho Provost 2005) that outlines the university general goals and strategies in four different categories. These are Teaching & Learning, Scholarly & Creative Activity, Outreach & Engagement, and Organization, Culture & Climate. Each of these categories has two objectives and several strategies listed which describe the methods with which the objectives are to be met. The SAP also contains a brief description of the university vision, values and direction, which outlines the key principles of the UI as undertaking “bold initiatives to promote science, technology, and their applications; to invigorate the liberal arts and sciences; to catalyze entrepreneurial innovation; to steward the natural environment; and to develop the design, lifestyles and civic infrastructures of sustainable communities” (Chart 9). (University of Idaho Provost 2005)

Teaching and Learning category has the goal to "engage students in a transformation experience of discovery, understanding, and global citizenship." (University of Idaho Provost 2005). The first objective for this category is to "build and sustain competitive advantages through innovative curricula of distinction" and seven strategies have been determined for achieving this objective. These include the development of learning outcomes on both university and individual program level, utilizing university and college core curricula, expanding partnership with industries, schools, and government authorities, and developing flexible class schedules and year-round programs for students. The second objective is to "develop effective integrative learning activities to engage and expand student minds" (University of Idaho Provost 2005) and it contains a list of seven strategies. These strategies aim to promote the development of students with engaging activities, such as co-curricular activities involving both students and faculty, integrating educational experiences to their living and learning environments, and providing personal mentoring and academic advising. (University of Idaho Provost 2005)

Scholarly and Creative Activity category aims for academic excellence in scholarly activities and creativity by promoting interdisciplinary collaboration and an institutional culture suitable for their growth. Its first objective is to "Promote an environment that increases faculty engagement in interdisciplinary scholarship." (University of Idaho Provost 2005) with seven strategies that mostly address enabling interdisciplinary activity that is deemed critical for the entire category. The second objective, containing eight strategies, addresses securing the environment and resources for promoting the growth of scholarly and creative activity, to support the University's educational, research, and outreach strategies. The strategies include securing physical and financial resources for University facilities, improving faculty benefits, increasing the number of graduate assistantships, and developing educational, research and technology transfer activities both in domestically and internationally. (University of Idaho Provost 2005)

The Outreach and Engagement category contains objectives and strategies involving interaction with local communities and partners. The goal of this category is to "engage with the public, private and non-profit sectors through mutually beneficial partnerships that enhance teaching, learning, discovery, and creativity". The first objective concerns the University of Idaho Extension and its connection with the rest of the University. The UI Extension is a division of experts and professionals who operate within the State of Idaho, interacting and collaborating with their local communities. Nine strategies are listed for this objective, which aim to further enable the UI to engage with Idaho communities, and expand and deepen partnerships with the industry, other educational institutions and public agencies. The second objective involves the UI's educational mission, with its six strategies concerning student involvement in outreach programs, developing these programs to meet the needs of both educational strategies and the communities, and having programs and stakeholders reflect the "faces and places of Idaho, including those who have been underserved or underrepresented". (University of Idaho Provost 2005)

Organization, Culture, and Climate is the last of the four goals listed in the UI Strategic Action Plan, and aims to improve the working and learning community within the University. This is deemed critical to enable successful execution of all other parts of the SAP, as described in the Context section of this goal: "to implement the first three goals of the strategic plan requires an organization adaptive to change and opportunity, and a community characterized by openness and trust". The first objective of this goal focuses on maintaining and improving the positive work climate to enhance the University life, and has a list of seven strategies. These include proper training and monitoring to ensure a safe working and learning environment, creating opportunities for students, faculty, and staff to collaborate with each other, providing opportunities for personal and professional growth, and recruiting and retaining a diverse body of students, faculty, and staff to enrich the quality of University life. The second objective is to "sustain and enhance an organizational structure, policies, and procedures that enable the University to attain its other goals" and it contains a list of eleven strategies. This objective aims to reduce barriers and organizational drag within the university by improving the administrative effec-

tiveness and streamlining the organizational structures and functions, as well as developing fund-raising, athletic, and art programs to improve recognizability and prestige. (University of Idaho Provost 2005)

In addition to the Strategic Action Plan of the University itself, the College of Natural Resources has composed its own Strategic Plan Working Document. This is largely an enhancement and modification to the UI SAP, introducing aspects specific to the CNR's field of education, research, and outreach. It contains the same four categories described above, however each of them has a list of Goals assigned under them, as opposed to each category representing a single goal as in the UI SAP. Each of these Goals contains two or more Objectives, each with a list of Strategies that describe the methods with which the objectives are to be attained. Additionally, the CNR Strategic Plan contains a list of External Challenges, which are described as "key external challenges that arise from national and international trends affecting all of higher education in the coming years". These challenges form the base context of formulation of CNR strategic planning, and are considered in the development and evaluation of CNR goals, objectives and strategies. In the 2008 version of the Strategic Plan Working Document these challenges are: "serving the public good with fewer public resources", "assessing and meeting the needs of more 'practical' constituencies", "proactively addressing changing needs and demographics of citizens and communities", "resurgent interest in natural resource and environmental issues", and "competition for quality faculty, staff and students, research dollars and private sector support". (University of Idaho Provost 2005)

4.2 General Core Study Modules

During their studies students at both University of Idaho and Mikkeli University of Applied Sciences are required to complete certain course modules defined as core studies. These modules have been set forth as compulsory studies for all students regardless of their major. The UI departments refer to these as the Core Curriculum, while at MAMK

they are known as Common Studies. The MAMK Study Guide 09/10 (Mikkeli University of Applied Sciences 2009) defines the objective of these studies as "to provide degree students with a common basis of knowledge independent of the degree programme and field of study". (Mikkeli University of Applied Sciences 2009)

The UI Core Curriculum is required from all University of Idaho students. It can be broken down to two parts: UI Core Requirements and UI General Core Studies (GCS). The Core Requirements hold the basics of university studies and are further divided into three categories: Communications, Natural & Applied Science, and Maths, Statistics & Computer Science. Each of these categories holds a number of courses, out of which the student is required to choose one or two for his or her personal curriculum. In Communications all students must take English 102 and an additional communications course from a list of eight courses. In the Natural & Applied Science a student must pick two courses from a list of 21, which contains science subjects such as biology, geology, physics and chemistry. Finally, a student must choose one course from the Maths, Statistics & Computer Sciences category that contains a list of ten courses in total. A student makes these choices with the assistance of his or her academic advisor. Although generally the choices can be made freely, some UI colleges may have specific requirements in some or all of these three categories. All in all the Core Requirements add up to a maximum of 18 credits. The Core Requirements are not generally listed as their own module in the degree programme curricula, but they are present as individual courses placed in the curriculum by the discretion of the respective UI department. For instance, the 2009-2010 Forest Products Business Management degree requirements contain Engl 102, Engl 313 & 317, Chem 101, 275 & 277, Phys 111, and Math 106 which cover all Core Requirement categories. (University of Idaho 2010b)

The UI General Core Studies (GCS) is another 18 credit module of the Core Curriculum that contains five different categories: CORE Discovery, Humanities, Social Sciences, an International Course and Additional Courses. The CORE Discovery holds two CORE

Discovery courses, humanities and science, which last an entire academic year and aim to acquaint the students with their new academic environment as well as "focus on college-level critical thinking, reading, communicating and other important skills". CORE Discovery courses add up to 7 credits in total. The following categories in Humanities and Social Sciences each require one course chosen from a list of approved courses and carry 3 credits each. To meet the credit requirement, students must select one International Course and then additional courses up to the limit of 18 credits in the GCS module. Unlike Core Requirement module, the GCS is usually listed as its own module in a degree programme curriculum. It should be noted that some departments, such as the Department of Forest Products, may report GCS credits less than 18 in their degree requirements. This is due to some courses in the Required Degree Option module overlapping with GCS requirements, allowing students to additionally satisfy the GSC requirements while taking them. Altogether the UI Core Curriculum sums up to 36 credits or more, depending on how many Core Requirement courses are contained in the degree requirements. The minimum is 18 credits but some degrees such as B.S. in Forest Resources can have a UI Core Curriculum module constituting almost half of the entire degree credits depth. (University of Idaho 2010c)

The Mikkeli University of Applied Sciences has set a cluster of four courses known as Common Studies to be incorporated in every degree programme. Each of these courses is 5 ECTS credits in depth, making the Common Studies cluster 20 ECTS credits in total. Each department within the MAMK is free to place the Common Studies courses into their curricula as they see fit, but they are strictly compulsory to all students. As the Common Studies cluster is small relative to the total depth of the MAMK degrees, departments classify it under the Basic Studies category. In the Department of Forestry, Common Studies cluster constitutes nearly half of the Basic Studies module. The Basic Studies modules have some other similarities between the MAMK departments, such as language courses, but the Common Studies courses are the only ones directly required from each department. (Mikkeli University of Applied Sciences 2009)

When comparing the UI Core Curriculum and the MAMK Common Studies, possibly the most obvious difference is the total credit depth of these modules. The entire UI Core Curriculum sums up to 36 credits, being almost a third of the 128 credit in B.S. degree. In some cases such as the B.S. in Forest Resources the Core Curriculum can reach up to almost 40 percent of the total degree credits (University of Idaho Office of the Registrar 2009). In the case of the B.S. in Forest Products the UI General Core varies between 9 to 14 percent of the total degree depth, but this does not take the Core Requirements into account (University of Idaho Office of the Registrar 2009). The Department of Forest Products classifies Core Requirement courses as part of the Required Degree Option module in the same way that MAMK departments prefer to merge Common Studies with the Basic Studies module. The MAMK Common Studies module consists of only four courses with a total of 20 ECTS credits, roughly 8 percent of the total 240 ECTS credits that its degrees carry (Mikkeli University of Applied Sciences 2009). However the entire Basic Studies module in MAMK degrees may be considered as an equivalent to the UI Core Curriculum, as its purpose is similar.

The credit total of the Basic Studies module varies greatly between departments, ranging from 30 to 87 ECTS credits. The departments themselves are mostly in charge of defining which part of their education can be classified as "basic", thus causing a lot of variance. The Department of Forestry has assigned 46 credits to its Basic Studies module (Mikkeli University of Applied Sciences 2009). This is somewhat similar to the variance in the UI General Core Studies courses offered by each degree. The UI departments can only offer some of the many courses listed as applicable for GCS categories and may have specific GSC course requirements for their students. As such, the structure of GCS studies depends greatly on which UI college and department a student has enrolled in. However the MAMK Basic Studies module has great variance in total credit depth, whereas the UI GCS credits are always standard 18 credits (University of Idaho 2007). All students of a MAMK degree share the same Basic and Common Studies, whereas the UI Core Curriculum allows students to select from multiple options in each of its categories as long as they satisfy the specific college and department requirements.

4.3 Comparison of MAMK Degree in Forestry and UI Degree in Forest Resources

The organizational structures are fairly similar between MAMK Department of Forestry and UI Department of Forest Resources. The departments are administered by a department head who works under the Dean of College or Rector. In addition to their administrative duties and representing their departments in executive meetings, the heads participate in education and research along with other faculty members.

Significant differences can be observed in the curriculum processes of the UI and MAMK departments. The UI process starts from the department level, where an appointed workgroup evaluates the need for curriculum changes and composes a report of suggestions that is presented to the rest of the department faculty. If approved in a departmental faculty meeting, the document is moved up the ladder to the CNR administration and posted to all college faculty for reviewing. Once approved on college level, the document is forwarded to the University administration and posted to the entire UI faculty. Final approvals are made by the UI Provost and the Idaho State Board of Education, after which the new curriculum will be printed in the next issue of the UI Catalog. In short, the UI curriculum process model is an inverted pyramid in which the notion for curricular revisions is made on the department level and then moved upwards in the UI academic hierarchy. (Department of Forest Resources 2006)

The MAMK curricular process is almost a completely reversed model of its UI counterpart. The curricular changes are analyzed in an annual, collective process that involves all MAMK divisions and departments. This starts with a seminar in which the common requirements and outcomes for MAMK educational services are defined. From the basis of this document expert workgroups analyze and define the specific requirements and outcomes for each MAMK division and its departments. Once all academic levels have finished the process, changes are posted to the MAMK Executive Board which approves them and composes the general course descriptions. After this final step the revised curri-

cula are published in the next issue of the MAMK Study Guide. In essence, the process moves downwards in the MAMK academic hierarchy, with the evaluation and revision process starting from the university level and moving down onto the department level. The process is also collective, opposed to the UI model that is based on departments initiating the process on their own discretion.

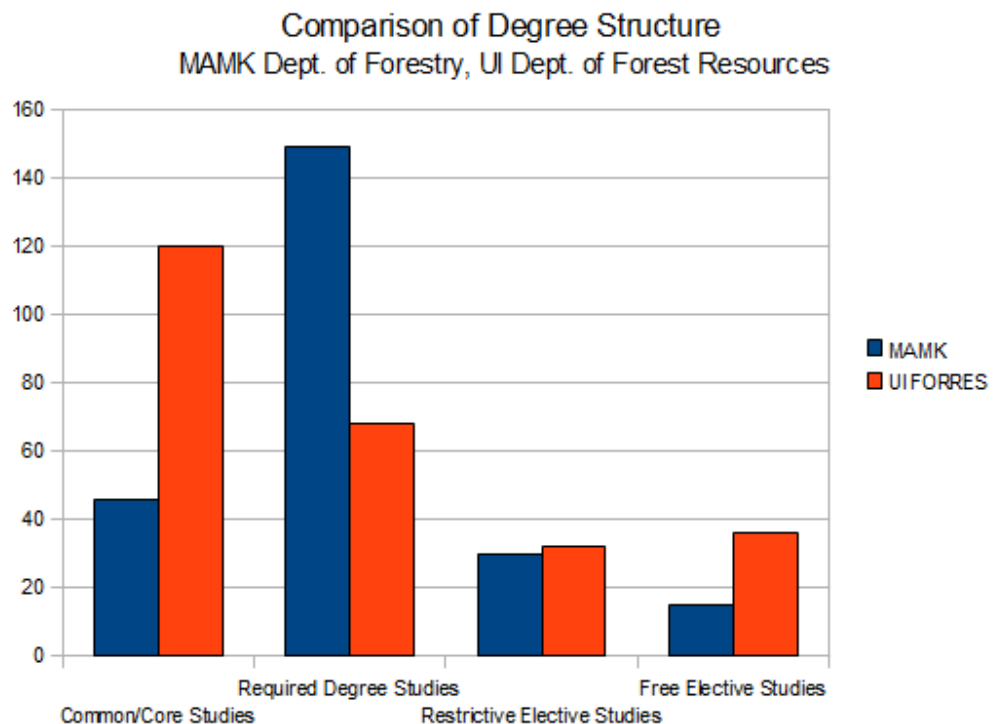


CHART 10. Comparison of degree structure between MAMK Department of Forestry and UI Department of Forest Resources. Bachelor's thesis and practical training modules have been accounted for in the Required Degree Studies category.

Credit total of the degrees is fairly equal: the MAMK B.S. in Forestry carries 240 ECTS credits, and the 128 UI credits of the B.S. in Forest Resources translate to 258 ECTS credits. However as illustrated in chart 10, there are some significant differences in the division of credits between the B.S. in Forestry and B.S. in Forest Resources degrees. Most obvious difference is the proportion of Common and Core Studies relative to the Required Degree Studies. The Common module includes Common and Basic Studies from

the MAMK degree, and UI Core Curriculum from the Forest Resources degree. In total these sum up to 46 ECTS credits for MAMK and 100 ECTS credits for UI Forest Resources, thus leading to the conclusion that Forest Resources places an extremely heavy emphasis on basic level studies - also when compared to the UI Degree in Forest Products.

This situation is reversed in the Required Degree Studies module. This category consists of Compulsory professional studies, practical training and the Bachelor's thesis for MAMK, and Required Forest Resources Curriculum for Forest Resources. This sums up to 149 ECTS credits assigned to this category by MAMK, and 88 by Forest Resources. Even if practical training and the Bachelor's thesis were removed from the equation and placed into their own respective categories (as MAMK does), the RDS module would still carry 104 ECTS credits. In essence, the MAMK Forestry degree is heavily focused on professional education on the expense of basic studies. It should be noted however, that this proportion is not a universal trend within MAMK; for instance, the MAMK degree in Material Technology has 87 ECTS credits assigned to Basic studies and only 63 to Compulsory professional studies (Mikkeli University of Applied Sciences 2009).

The Restrictive Elective Studies module includes Optional professional studies from MAMK and Restrictive Electives from Forest Resources. In this category there was only a difference of two credits between the compared curricula. The Forest Resources Restrictive electives and MAMK Optional professional studies share many similarities in function. Their purpose is to allow students to specialize in certain fields of forestry and forest resources, by choosing from a list of courses or clusters. In MAMK the Optional professional studies consists of four different 15 ECTS credit course clusters with different themes (Mikkeli University of Applied Sciences 2009). A student must choose two of these clusters for his or her personal curriculum by the end of the second year of study. In the 2009-2010 degree curriculum (Mikkeli University of Applied Sciences 2009) these clusters are: Marketing and Communication in Forestry, Private Forestry, Applications in Wood Procurement and International Forestry. It is this cluster-based system that differentiates the MAMK Optional professional studies from the UI Restrictive electives. The

UI Forest Resources curriculum includes a list of Restrictive elective courses that sums up to 66 ECTS credits. A student must choose courses from this list to a total of 32 ECTS credits using his or her personal discretion. The list also includes a sub-category of six courses, of which every Forest Resources student must select two (University of Idaho Office of the Registrar 2009). To assist in effective study planning the department assigns academic advisors to its students. These advisors will help students in choosing the most effective combination, using so called Career Tracks as a guideline (Department of Forest Resources 2006).

Notable differences were observed in the Free elective studies. These studies are similar in function to the Restrictive electives, but are not restricted to a certain set of courses or clusters. The MAMK Department of Forestry and the UI Department of Forest Resources handle free elective studies in a rather identical fashion; a student can choose courses offered by any department or college in the university, or even take courses from other universities. The only real difference is the amount of free electives students are allowed to take, being 15 ECTS credits at MAMK Department of Forestry and 36 ECTS credits at UI Department of Forest Resources. Free electives are not restricted by a student's major, department or college, although course-specific pre-requisites impose a limit on how freely they can be chosen. The Department of Forest Resources has over twice as much Free elective credits than the MAMK Degree in Forestry, thus giving the students more freedom in planning their personal curriculum and knowledge base. This is also to allow UI students to pursue an academic minor, which is not possible at MAMK. (Department of Forest Resources 2006; Mikkeli University of Applied Sciences 2009)

However, MAMK has assigned a significant number of credits to a module called Practical training, which in this comparison was classified under the Required Degree Studies for practicality issues as the UI Department of Forest Resources has no direct equivalent to it. Practical training is one of the essential parts of any MAMK degree and its depth ranges from 30 to 85 ECTS credits, depending on the degree. In the MAMK Degree in

Forestry the Practical training module carries 30 ECTS credits, roughly 13 percent of the entire degree credit total. The MAMK Practical training is a form of school-supervised internship, carried out in the employment of a private organization, company or governmental institute in tasks relevant to the student's degree. Over the course of the practical training period a member of MAMK faculty will visit the student at his or her place of internship to interview both the student and his or her superiors. Additionally, at the end of the practical training period a student and the employer will fill out evaluation reports that measure and comment on the student's performance. The employers will also be able to send feedback to the university on what changes they may see necessary in their education, based on the performance of the interns. (Mikkeli University of Applied Sciences 2009)

Practical training is not required by the Forest Resources curriculum, although the department mentions the supporting functions of the CNR Dean's Office in helping students find internship and summer employment. According to its report for re-accreditation (Department of Forest Resources 2006), "virtually all Forest Resources students who seek summer jobs in forestry can get a job" and that "employers who contact the CNR office in April and May for summer employees often learn that there are no students available". However these jobs and internships are not accounted for in the degree curriculum and will not provide a student with any additional credits. (Department of Forest Resources 2006)

The Bachelor's thesis is another point of difference between the degrees. At MAMK departments the thesis is an integral part of any degree, always carrying 15 ECTS credits. An approved thesis and a maturity test are required of all MAMK graduates. The class schedule of the final year of study has time specifically assigned to independent thesis work and students are required to participate in guidance group sessions that assist in orientation for thesis work. A member of the departmental faculty is assigned as the academic thesis advisor for each thesis project. A thesis can be done individually or in

groups and can be carried out as commissioned work for a third party organization such as a forestry company. A finished thesis document will be passed to the respective academic advisor, who reviews it over the course of one week. After the advisor has reviewed the document and necessary corrections or additions to it have been made based on the advisor's feedback, the document is reviewed once more by at least one other faculty member. Once the document itself is approved, a public presentation is held. The student must present his or her thesis to an audience consisting of other students and members of the faculty, as well as representatives of a possible commissioning party. After the presentation a thesis opponent (selected from senior students) and the academic advisor will hold commentary on the thesis. Finally the student must undertake the maturity test which surveys his or her knowledge on the thesis project as well as linguistic competency. (Korhonen 2009; Mikkeli University of Applied Sciences 2009)

The UI Forest Resources degree has a thesis project listed in its curriculum, titled as Senior thesis (FOR 497). However, it is listed under Restrictive Electives module, meaning that it is optional to all students (University of Idaho Office of the Registrar 2009). The senior thesis is not listed in any Career tracks and only carries 4 to 8 ECTS credits (Department of Forest Resources 2007).

4.4 Comparison of MAMK Degree in Forestry and UI Degree in Forest Products

As was the case when comparing MAMK and the Department of Forest Resources, the administrative models are fairly similar. Both departments have an appointed department head in charge of departmental administrative duties and representing his or her department in executive meetings. The head answers directly to the Dean of College or the Rector. The head also participates in education and research activities along with other members of the department faculty.

The UI Department of Forest Products follows a similar process in curricular revisions as

the Department of Forest Resources. The department holds monthly meetings during which academic policy and curriculum changes are discussed. Each of the three Forest Products degree options is under the oversight of at least one faculty advisor. The task of these advisors is to evaluate the need for any curricular revisions on an ongoing basis and if any need for changes is found, the advisors are to present these at the next department meeting. If approved by the department faculty, the proposition for changes is submitted to the CNR administration and onwards in the same process as described previously with the Department of Forest Resources. (Department of Forest Products 2004)

As such, regarding the curriculum revision process the comparison between MAMK and Department of Forest Products reaches the same results. At MAMK the initiative for curricular changes comes from the university administration level instead of the departmental level and moves in the academic hierarchy from top to bottom. Also, the MAMK curricular revision is an annual, collective process that involves all its divisions and departments.

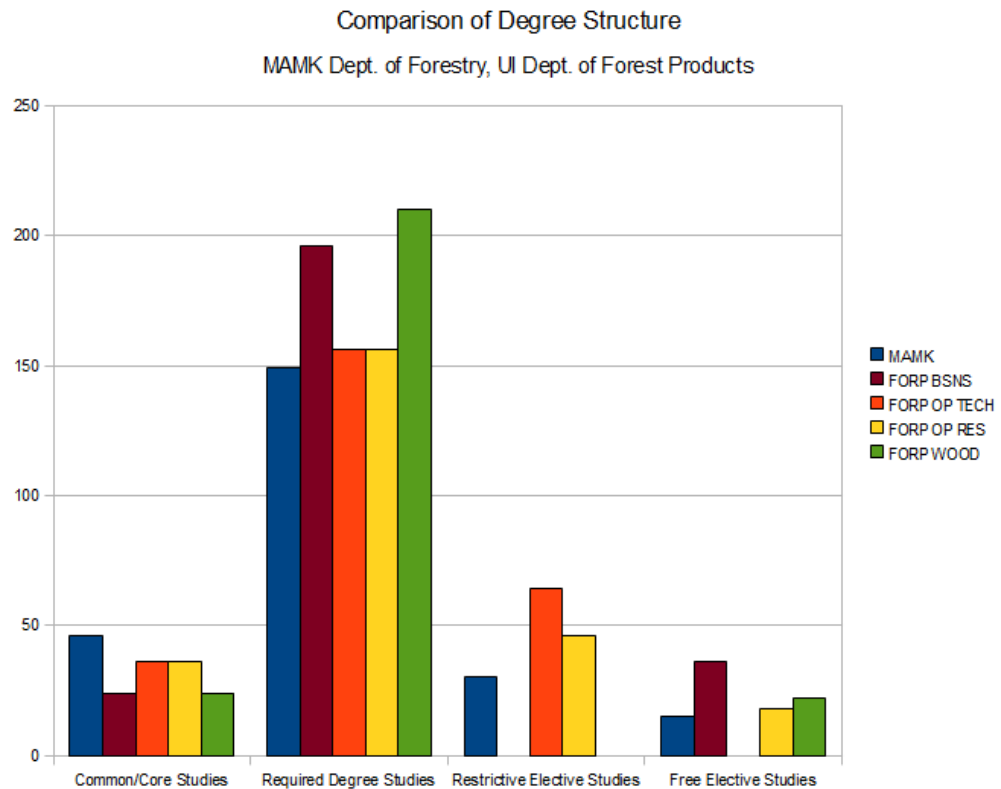


CHART 11. Illustration of degree structure differences between MAMK Department of Forestry and UI Department of Forest Products. Bachelor's thesis and practical training modules (MAMK) have been accounted for in the Required Degree Studies category.

As was the case with the Degree in Forest Resources, the degree credit total is similar to the MAMK degree and the UI Degree in Forest Products. Forest Products is broken down to three different Degree options: Forest Products Business, Forest Operations and Wood Construction and Design. Furthermore, the Forest Operations option has two different areas of emphasis: Technical emphasis and Resource emphasis. All these sum up to 128 UI credits each, or 256 ECTS credits. The MAMK Degree in Forestry is 240 ECTS credits in total. Both of these degrees are typically taken over the course of 8 semesters within 4 academic years. However, significant differences can be observed in the credit divi-

sion both between the MAMK and the Forest Products degree, and between the individual Degree options of the Forest Products degree (chart 11). (Department of Forest Products 2004; Mikkeli University of Applied Sciences 2009)

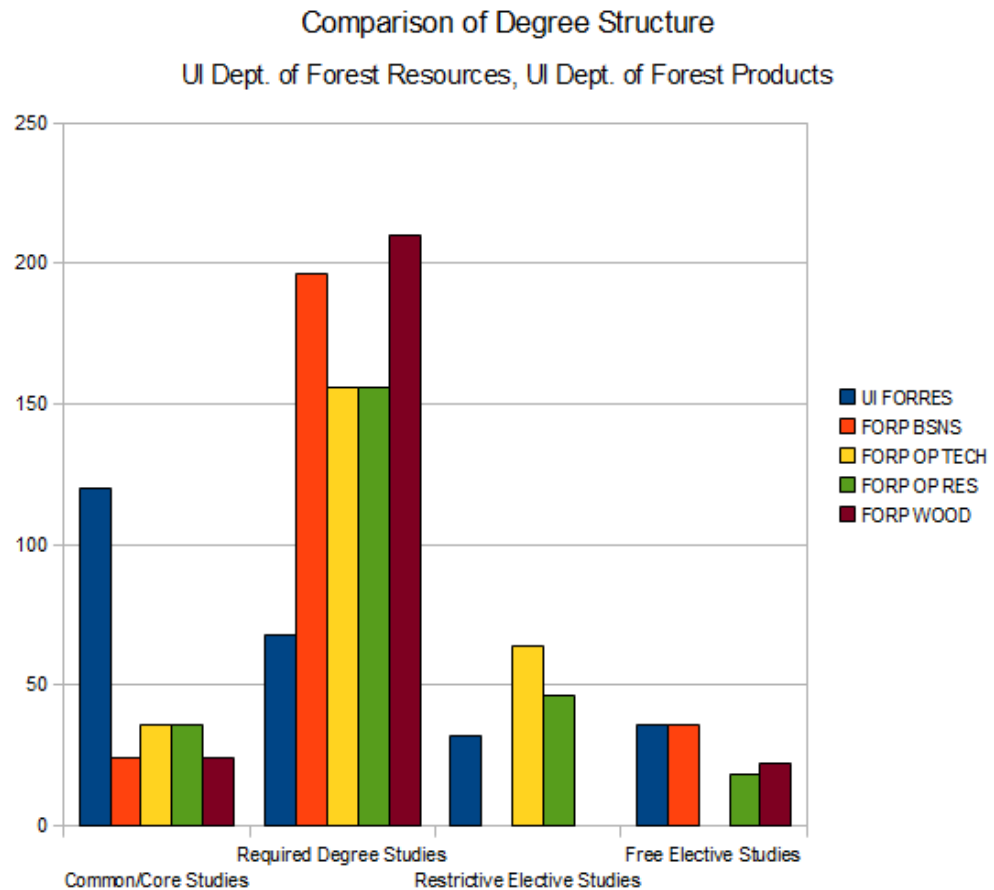


CHART 12. Illustration of degree structure differences between UI Forest Resources and Forest Products degrees.

The UI Forest Resources degree places an extremely heavy emphasis on Common/Core studies, with almost three times as much credits assigned to that category than the MAMK Degree in Forestry. However this is not the case with the Degree in Forest Products, as illustrated above (chart 12). Depending on the degree option, the total number of

credits assigned to the Common/Core studies is either 24 (Forest Products Business, and Wood Construction & Design) or 36 (Forest Operations) ECTS credits. The MAMK degree carries 46 ECTS credits in this category, roughly twice as much the Forest Products Business and Wood Construction credit options, and slightly more than the Forest Operations option (chart 12). However it should be noted that the Department of Forest Products does not report the UI General Core Studies as a part of the Common/Core studies as the Department of Forest Resources does; instead, GCS courses are listed among the Required Degree Studies due to them overlapping with the required curriculum studies, allowing students to satisfy both Required Degree and GCS at once. As such, there may not be as much difference in the curricular content but in the manner with which the departments use to represent their degree structures. (Department of Forest Products 2009a; Department of Forest Products 2009b; Department of Forest Products 2009c)

In the Required Degree Studies category there are some significant differences between the degrees and degree options. The Forest Products Business and Wood Construction and Design both have notably higher number of credits assigned to this category in comparison to the Forest Operations option and the MAMK Degree in Forestry. As these two degree options lack any restrictive elective studies, this category forms the bulk of their degree structure with close to 200 ECTS credits assigned to it in Forest Products Business and as much as 210 in Wood Construction and Design. The Required Degree studies represent the compulsory coursework for all students pursuing a degree or a degree option. Both MAMK Degree in Forestry and the Forest Operations degree option have less emphasis in this category; 149 ECTS credits in MAMK Forestry (including the Bachelor's thesis and Practical training) and 156 ECTS credits in both emphases of the UI Forest Operations degree option (Mikkeli University of Applied Sciences 2009; Department of Forest Products 2009b). However it remains as the most significant category of degree studies in all the aforementioned degrees and options.

The Restrictive Elective Studies category only contains the MAMK Degree in Forestry

and the Forest Operations degree option. This is due to the absence of any restrictive elective studies in other Forest Products options. The Forest Operations option does not have studies classified as restrictive electives, but it was seen fit to classify its Required Emphasis Block under this category as they are similar in function; to allow a student to further specialize in a certain field within their major. The Forest Operations option offers two distinct fields of emphasis of which a student is to choose one (Department of Forest Products 2010a). These are called the Technical emphasis and the Resource emphasis. These fields mainly share the same curriculum, but each has a unique cluster of courses called the Required Emphasis Block that contains courses specific to that field of emphasis. Courses in these blocks are taken throughout the length of the degree starting from the freshman year. The credit count of the blocks is not uniform; the Technical emphasis has 64 ECTS credits assigned to this category, while the Resource emphasis has 46 (Department of Forest Products 2009b). In a similar fashion the MAMK Degree in Forestry contains Optional Professional Studies, which allow a student to specialize in two of a total of four different fields of emphasis. Each field is represented as a cluster of courses summing up to 15 ECTS credits each, bringing the total depth of MAMK Optional Professional Studies to 30 ECTS credits (Mikkeli University of Applied Sciences 2009). As such, the MAMK Degree in Forestry has considerably less emphasis on Restrictive Elective Studies than the UI Forest Operations option. On the other hand the MAMK degree has a wider selection of these studies with a total of four different clusters of which two are chosen. A notable difference is that the MAMK Optional Professional Studies start in the third year of study and are not required to be chosen until by the end of the second year, as opposed to the Forest Operations emphasis which is required to be chosen at the beginning of the first year of study (Mikkeli University of Applied Sciences 2009; Department of Forest Products 2010a).

The Free Elective Studies category contains studies which can be freely chosen by the students to widen their knowledge and skill base within and outside their major. At the University of Idaho this also allows students to pursue an academic minor. As such, the most focus on this category can be found in the Forest Products degree options that are

the most multidisciplinary: Forest Products Business and Wood Construction & Design. As these options contain business studies and architecture as an integral part of their curricula, students are given more leeway to pursue an academic minor in these overlapping fields to maximize their knowledge and skills in these specific fields of forest and wood products industry (Department of Forest Products 2010c; Department of Forest Products 2010d). As such, students in the Forest Products Business option are allowed to choose free elective courses up to 32 to 36 ECTS credits, and in Wood Construction & Design free electives add up to 22 ECTS credits in total (Department of Forest Products 2009a; Department of Forest Products 2009c). The Forest Operations Resource emphasis allows for up to 18 ECTS credits of free electives, but the Technical emphasis has none (Department of Forest Products 2009b). Instead the Technical emphasis has a considerably larger portion of credits assigned to its Required Emphasis Block. The MAMK Degree in Forestry has 15 ECTS credits assigned to this category (Mikkeli University of Applied Sciences 2009). All compared degrees and options handle free electives in a similar fashion; they may be chosen from any degree curriculum, department or college, or even from other universities (Department of Forest Products 2004; Mikkeli University of Applied Sciences 2009). However, free electives cannot overrule course-specific prerequisites that may apply.

The Department of Forest Products has no equivalent component to the MAMK Practical training (previously described on page 39) in its curriculum, but its Forest Products Business Management option contains a compulsory course titled Renewable Natural Resources Internship (FORP 498) that requires the students to complete a summer internship in a forest products company which is then approved by their academic advisors (Department of Forest Products 2009a; Department of Forest Products 2004). This course only carries 2 ECTS credits, compared to the 30 ECTS credits assigned to the Practical training module by MAMK. Other degree options in Forest Products do not have specifically required internships, but the advisors "strongly encourage students to seek meaningful summer work experiences" (Department of Forest Products 2004). The Degree in Forest Products also lacks any direct equivalent to the Bachelor's thesis (described on page

39-40) in any of its degree options, although a student may be able to select a senior thesis course from another department. (Mikkeli University of Applied Sciences 2009; University of Idaho Office of the Registrar 2009)

4.5 Student Assistance and Advising

Student counseling is recognized as an important tool in aiding university students to find and maintain their commitment and motivation, as well as help them plan their personal curriculum. Both MAMK and UI have set forth schemes on both college and department level to help students in orientation and finding their place in the academic world. As studies progress, advisors and counselors will guide students towards what best matches their personal interests and skills. According to the MAMK Study Guide 09/10 (Mikkeli University of Applied Sciences 2009), with these important support functions "the students' inner growth and development towards an independent and flexible, physically and mentally balanced professional will be enhanced". The University of Idaho Strategic Action Plan 2005-2010 (University of Idaho Provost 2005) also mentions creating "formal and informal opportunities for students, staff, and faculty to learn from each other and build meaningful collaborations." as one of the organization, culture and climate strategies.

The MAMK Department of Forestry has assigned one member of faculty as an OVA (opiskelijavastaava, engl. student correspondent), whose task is to plan and execute a module called Professional growth (Ammatillinen kasvu) together with a teacher tutor. The teacher tutor is a member of the faculty who is assigned for each group of freshmen to collaborate with the OVA and plan the counseling of his or her group. This module is classified under Basic studies and executed as a series of courses throughout the first three years of study, carrying a total depth of 5 ECTS credits. Student tutors are also selected to complement the departmental support functions and guide students in matters regarding the student life and the environment. In the beginning the student assistance is aimed to integrate the student into his or her new professional field, student group, study

location and strengthen the studying motivation. Counseling is carried out both personally and in groups, as well as using the Moodle e-learning platform. After the fall vacation week (week 42 at the MAMK Department of Forestry) freshmen go through individual counseling sessions conducted by the OVA, the teacher tutor and the Department Head. During their second spring semester students go through another individual counseling session, aimed to guide them in choosing their Optional professional clusters and Optional studies which start in the fall semester of the third year of study, planning out their future career and searching for internship positions to meet the Practical training requirement. Additional counseling for international studies or internship, entrepreneurship, study projects and practical training will be given as it is needed. The departmental faculty has specialized assigned positions for Bachelor's thesis advisors, international, and adult student counseling.

In the University of Idaho Department of Forest Resources each student is assigned a faculty advisor by the end of their freshman year. These advisors are required to meet with their students at least once each semester and are in charge of providing support and guidance in registering for classes, making changes to personal curriculum and discussing career opportunities. Students are required to consult their advisors before registering for the next semester's classes, adding or dropping courses after the period for doing so has expired, and to petition for any courses. The advisors use so called Career Tracks to help students pick Restrictive and Free elective courses that best guide them towards their ideal career opportunities. These tracks are predetermined clusters of courses available to students as Restrictive and Free electives, and there are nine in total. Selecting a career track is not compulsory and it can only be used as a referential guide. The advisors also provide students with advice and information on internship positions and summer jobs, as well as post-graduation opportunities such as permanent jobs and graduate schools. In the beginning of their freshman year all CNR students also participate in the Exploring Natural Resources course (NR 101), which is designed to serve as an initial orientation module. NR 101 is part of the CNR Integrated Course Curriculum, which serves a similar purpose as the MAMK Professional Growth module.

The University of Idaho Department of Forest Products has a similar system as the Forest Resources: all undergraduate students are assigned a faculty advisor to providing the students with guidance and support. Each Forest Products faculty member has typically six to eighteen students under his or her guidance. The students will consult their advisors before making any class registration for the next semester. After these sessions students may fill out advising evaluation forms which are used for feedback and are discussed at the annual faculty meetings.

4.6 Reliability assessment

The study was conducted using official materials from all involved parties. Before and during the process the validity and up-to-date nature of these materials was confirmed by the parties they were acquired from. The accreditation reports from the UI departments were confirmed to be valid during the time this study was conducted. The public materials available on the websites of the universities, colleges, and departments were used as they were during the timeframe of the study. The factor that most determined the reliability of the study lay in the comparative process derived from these materials. For this purpose, several spreadsheet documents were composed and used to build comparative graphs based on the data derived from the source materials. The purpose of the study was to shed light on some key differences and similarities rather than provide personal analysis on why they may have existed. To retain this focus, the author refrained from making unnecessary deductions on what the reasons and motives behind different ways of doing things may have been.

5 CONCLUSION

Over the course of this study many differences could be observed in all categories. Perhaps the biggest single difference lies in the very nature of the universities compared. In addition to being an educational institution, the University of Idaho comprises scientific research facilities that correlate directly with the operation of its departments. As a University of Applied Sciences, MAMK has its research and development activity focused in the field of applied sciences, with such fields of emphasis as entrepreneurship in nursing business, arranging tourism programs to Russian visitors, material technology, and digitizing 3D and motion picture material (Mikkeli University of Applied Sciences 2009). Both universities emphasize their regional operations as a part of their strategy. For instance MAMK stresses its beneficial influence through its university collaboration and strategic partnerships in the South Savonian region of Finland and expertise in Russian operations, specifically within the Russian Federation's Northwestern Federal District (Северо-Западный федеральный округ) and the St. Petersburg area (Санкт-Петербург) (Mikkeli University of Applied Sciences 2009). In a similar fashion the University of Idaho has the UI Extension to execute its outreach strategies to benefit the communities throughout the State of Idaho (University of Idaho Provost 2005).

The learning outcomes of both MAMK and UI departments are largely similar in content and goals, differences being mainly in their formation and degree-specific emphases. The UI degrees can also be extended to M.Sc. and Ph.D. levels after a student has completed a B.S. degree, and this possibility is mentioned as one option for graduates. MAMK has introduced M.Sc. level studies in 2008, but they cannot be taken by fresh graduates; one of the M.Sc. applicant requirements is work experience of at least three years in the field relative to the degree. As such, MAMK graduates are required to work at least some years in their fields to be able to return for graduate school (Mikkeli University of Applied Sciences 2010b).

A clear difference between the universities lies in the curriculum revision process. In this matter the universities utilize procedures that are almost reverse cases of each other. The

curriculum of a UI degree is constructed in a process that begins from the departmental level and proceeds upwards step-by-step in the university's academic hierarchy; from departmental to college level, from college to university level. This process begins when departmental faculty members are assigned to evaluate a degree curriculum and propose any changes that may be necessary. However, at MAMK the curricular revision is a collective, annual process that involves all educational departments in the university. Though for example the Department of Forestry holds bi-annual meetings where such things as the curriculum are discussed, the initiation for the revision process comes from the university level, rather than from the initiative of an individual department. During the process requirements and outcomes based on the university strategies and goals are defined to allow the departments to adjust their curricula accordingly. (Department of Forest Resources 2006; Department of Forest Products 2004; Hytönen 2006)

As for the degrees themselves, the University of Idaho offers two separate degrees in the field of forestry, whereas the MAMK only has one. Furthermore, the Degree in Forest Products is divided into three distinctive degree options to provide specialization in forest operations, forest products business, or wood construction and design (Department of Forest Products 2004). Though both the UI Degree in Forest Resources and the MAMK Degree in Forestry include specialization as a significant part of their curricula with 32 and 30 ECTS credits respectively, their students largely share the same degree curriculum. The Forest Products degree options have so different curricula starting already from the freshman year that they could well be considered as individual degrees. In terms of credits, there is a lot of variance between all degrees in how the credits are divided between individual curricular modules, but the credit total of both the UI and MAMK degrees is largely the same: 256 and 240 ECTS credits respectively. The significance of the 16 credit difference can be questioned; does it really originate from the actual difference in total amount of teaching and learning, or is it simply a result of the most convenient if not accurate conversion rate between the US and ECTS credit standards?

In terms of curricular content itself the MAMK Degree in Forestry is perhaps closest to the UI Degree in Forest Products Forest Operations and Business Management options. However, the 23 ECTS credit Forest Management Planning and 16 ECTS credit Forest Environment clusters in the MAMK Degree's Compulsory professional studies contain similar non-industrial and scientific themes as the UI Degree in Forest Resources. As for the similarity to the Forest Products options, the MAMK Degree contains themes from both Forest Operations and Business Management options roughly equally. The Optional professional studies clusters also allow students to pursue more business- or wood procurement-focused specialization. In essence, the MAMK Degree in Forestry could be considered as a mixture of the Forest Operations and Business Management options from the UI Degree of Forest Products, with an academic minor in Forest Resources. The MAMK Degree shares very little in common with the UI Forest Products Wood Construction & Design option, however.

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