Degree Programme in Natural Resources and the Environment, Agriculture (240 cr)

English translation, degree programme conducted in swedish.

Degree: **YH-examen inom naturbruk**
Qualification title: **Agrolog (YH)**
Duration of studies: **4 years**
Study type: **Full-time**

» Generic competences
» Language Information for Students with Swedish or Finnish as Prior Language of Instruction.

Kontaktuppgifter: Enheter | Utbildningsansvariga

Code	Name	Cr/year/total					
		1	2	3	4	5	Total
Gru	**Core studies**						66 cr
BE16PI	**Practical introduction to the profession**	12					12 cr
NM13PI01	• **Practical skills** *The student* *- can identify different types of soil* *- understands and can account for significant earth and soil properties* *- can choose a suitable method for soil cultivation based on a specific situation* *- can identify and describe the botanical and biological properties of common crops, as well as of weeds occurring in autumn sown crops* *- can assess the pros and cons of different methods for the establishment of autumn-seed crops and can plan establishment and management measures to minimise the risk of winter damage* *- knows common breeds of domesticated animals in Finland* *- can perform practical work in cowsheds concerning cattle and milk production*	3					3 cr
BE16PI01	• **Tractor technology and agricultural machinery** *The student* *- knows the most common field machines in the agricultural industries* *- has an understanding of cost-effective and sustainable machine usage* *- has an idea of the future development opportunities of agricultural machines* *- has learned to use tractors and commonly used agricultural machines* *- can perform daily machine service*	3					3 cr
BE16PI02	• **Anatomy and physiology** *The student* *- understands the anatomy and physiology of domesticated animals and their effects on feeding and breeding of production animals (cattle, pigs, sheep, poultry and horses)*	3					3 cr
BE16PI03	• **Forestry prerequisites** *The student* *- knows the conditions for wood production in Finland and understands how tree species and different production conditions affect each other* *- knows how society manages forestry in terms of constraints and opportunities, including current forest legislation* *- knows the most important Finnish peat habitats and their origins* *- can identify habitats protected by laws and social agreements and knows the plants (key species) needed for habitat determination* *- can in practice perform care and clearance work in the forest on plant and young forest stocks according to given instructions and taking into account occupational safety regulations* *- can perform basic service on a clearing saw*	3					3 cr
BE16EK	**Ecology**	6					6 cr
BE16SE01	• **Botany and ecology** *The student* *- knows how a plant is structured and functions* *- knows fundamental physiological functions of plants, e.g. photosynthesis and respiration* *- understands the basis of plant systematics* *- know the nature, ecology and most important processes in our most common ecosystems* *- understands the concept of ecosystem services* *- can account for the dynamics of natural and man-made ecosystems*	3					3 cr
NM13BK01	• **Forest site types and dendrology** *The student* *- knows the forest type classification system* *- can identify plants in the forest type classification system* *- can identify the main domestic trees and bushes*	3					3 cr
BE16LV1	**The agricultural expert's toolbox I**	6					6 cr
UONB10IK01	• **ICT** *The student has a good command of:* *- the IT services of the UAS and the utilities needed in work and studies in order to compile written assignments, analyse data and report projects* *- file handling* *- word processing programs used for creating and handling standard documents, official letters and reports* *- word processing programs used for creating and handling lengthy documents including e.g. a list of contents and a list of references* *- spreadsheet programs needed to handle calculations including formulae, functions and charts* *- presentation graphics programs used for making presentations*	3					3 cr

NM13NA03	• **Mathematics** *The student:* *- understands that independent work, focusing and accuracy constitute the conditions for learning* *- understands that it is important to cooperate and to be sensitive for different angles of approach and to take them into consideration* *- knows how to solve mathematical problems* *- is able to apply the trigonometry of a right-angled triangle* *- is able to solve polynomial equations and interpret polynomial functions graphically* *- is able to represent and calculate by using arithmetic and geometric series* *- understands how scientific phenomena can be described by using mathematical functions and models* *- knows how to use basic logarithm rules in order to solve exponential equations* *- understands the reasons for using and the possibilities gained by using logarithm and exponential functions* *- is familiar with the concepts of limit, differential coefficient and integral and knows how to apply rules for simple functions*	3					3 cr
BE16PK	**Professional Communication**	12					12 cr
RB14IN01	• **Introduction to Academic Studies** *The student* *- is familiar with his/her UAS and Campus* *- is aware of the gain of activating methods of learning* *- can reflect on his/her studies and future plans and is aware of his/her individual learning style* *- can plan and follow up his/her studies* *- can generate new knowledge and create personal learning environments and share knowledge with others* *- can reflect on life-long learning within the profession* *- can retrieve and critically view information*	3					3 cr
YH10SV01	• **Swedish** *The student:* *- can communicate coherently and in a professional manner both orally and in writing, in a work context* *- demonstrates appropriate knowledge of the process of academic writing and a correct use of references* *- can use different channels to retrieve information and compile reports according to the standard form and layout* *Students with Finnish as prior educational language have to show such skills in the Swedish language as are in accordance with the Act on the Knowledge of Languages Required of Personnel in Public Bodies (424/2003). This means that these students must show satisfactory (grade 1, 2 or 3) or good (grade 4 or 5) skills in speaking and writing Swedish. Written and oral skills are assessed separately.*	3					3 cr
YH10FI01	• **Finnish** *The student:* *- demonstrates ability to communicate in a natural and professional manner, in speaking as well as writing, in a work context, including customer service* *- demonstrates proficiency in the terminology of the field and is able to benefit from research and literature in his/her professional development* *- shows such skills in the Finnish language as are in accordance with the Act on the Knowledge of Languages Required of Personnel in Public Bodies (424/2003).* *This means that the student must show satisfactory (grade 1, 2 or 3) or good (grade 4 or 5) skills in speaking and writing Finnish. Written and oral skills are assessed separately.*	3					3 cr
NM14BP01	• **Project in our line of business** *The student* *- can plan, implement and evaluate an industry-specific project* *- has basic insights into their own industry* *- can use tools in project planning and management* *- knows how teams are formed and developed* *- can work with others in groups and teams regardless of background* *- knows the project leader's role and tasks*	3					3 cr
BE16LV2	**The agricultural expert's toolbox II**		15				15 cr
NM13SI01	• **Forest mensuratiojn 1** *The student* *- can measure trees, tree stocks and growth* *- can, with the help of tables, calculate volumes of individual trees and tree stocks* *- knows the definitions of different development classes and can identify these in the field*		3				3 cr
NM13NA01	• **Handling of GPS and GIS** *The student:* *- knows how to plan and realize gathering of position-specific information* *- is able to produce geographical information for the use of the natural resources sector* *- knows how to localize existing GIS information on the Internet and the databases of his/her own organization*		3				3 cr
NM13NA02	• **Handling of data related to natrual resources**		3				3 cr

	The student: *- knows how to arrange and process gathered data into information* *- is familiar with the methods related to the effective storage of large quantities of information* *- is able to use spreadsheet (e.g. Excel) in an effective and versatile manner for the storage, analysis and presentation of data* *- knows how to validate the correctness of data* *- knows how to choose and use statistically correct methods to meet various objectives*						
BE16MN01	• **Landscape Management** *The student:* *- knows how to assess ecological, aesthetic and economic values* *- is able to understand the cultural values of landscape* *- learns how to communicate with and understand the active parties within the natural resources and environmental sector* *- knows how to administer areas with landscape values (planning and management)*		3				3 cr
YH10EN01	• **English** *The student:* *- shows the ability to communicate in a professional manner in a work context in speaking as well as writing* *- is familiar with essential terminology within his/her field and is able to benefit from professional literature* *- has a positive attitude to developing his/her receptive and productive language skills and is familiar with the relevant tools* *- is aware of cultural differences in international contexts*		3				3 cr
BE16GS	**Forest farming**		9				9 cr
BE16GS01	• **Forestry** *The student* *- knows how tree stocks in forests develop during a cycle and how they need to be managed in order to achieve profitable timber production* *- has acquired basic knowledge of the timber trade and timber harvesting* *- has an understanding of their own effectiveness and ability in forest work in order to be able to calculate profitability for different types of sales and various forms of contract work*		3				3 cr
BE16GS02	• **Forest farming** *The student* *- understands the importance of long-term sustainable forestry* *- knows the reasons for maintaining logging-free forests* *- knows the national database of forest assets and can use the service at www.minskog.fi in relation to forest farming* *- knows what a forestry plan contains and with the help of it can estimate the importance of forestry in relation to the entire activity of a farming company* *- can roughly estimate volume, growth and harvesting opportunities in terrain*		3				3 cr
NM13VA01	• **Felling Technique** *The student* *- can perform motor-manual felling safely* *- can take into account various requirements when processing timber* *- can perform basic service on chainsaws* *- is familiar with how small-scale timber harvesting is planned and implemented*		3				3 cr
BE16IL	**Thesis Introduction**			6			6 cr
BE16IL01	• **Research Methodology** *The student:* *- knows the fundamentals of the theory of science* *- is able to describe and apply relevant research methods* *- knows how to make a plan for a scientific thesis* *- knows how to document and communicate his/her research findings* *- knows how to search for information from various sources* *- knows how to compile information in accordance to established scientific practices* *- understands the objective of a degree thesis and the requirements placed on it*			3			3 cr
NM13UM02	• **Statistics** *The student* *- understands the need for statistics as a tool for analyzing information* *- masters the most basic statistical concepts* *- understands the importance of a correct selection procedure in the collection of data* *- knows how to perform hypothesis testing* *- understands the importance of complying with the terms and conditions of statistical tests* *- has a good command of the most important statistical macros and functions of the spreadsheet program MS Excel and is familiar with the possibility of using real statistical software* *- knows how to interpret and present the results of an analysis*			3			3 cr
Yrk	**Professional studies**						120 cr

BE16VGI	**Basics of plant production I**	15					15 cr
BE16VGI01	**• Plant breeding and seed production** *The student* *- possesses basic knowledge of biochemistry, general genetics and plant breeding* *- knows the historical development of plant breeding* *- has mastered the biochemical and genetic basics of plant breeding and animal husbandry* *- is aware of the key methods used in the practice of and understands the meaning of the term genetic modification* *- knows the basics of and conditions for seed trade and seed cultivation in Finland*	3					3 cr
BE16VGI02	**• Farming land and soil cultivation** *The student* *- is fully aware of income-generating factors* *- understands how different climate factors affect the prerequisites for plant production in Finland, including the composition of common soils in Finland* *- knows which factors have affected Fennoscandic soils during their formation*	3					3 cr
BE16VGI03	**• Soil theory and protection** *The student* *- understands the importance of soil fertility in crop cultivation* *- has the knowledge, derived from a basic understanding of the physical, biological and chemical properties of arable land, to preserve or improve the fertility of soil,* *- is aware of the causes of central threats to the fertility of arable land, such as soil packing, reduced mould content and acidification*	3					3 cr
NM13VG01	**• Production biology** *The student* *- has acquired basic knowledge of national and international plant and food production* *- can identify the most commonly cultivated plant seeds in Finland and knows the basic botany and production biology of crops* *- knows the different wintering strategies of plants* *- knows and can use developmental scales for cereal and oil crops* *- understands possible objectives when cultivating various cereal and oil crops and, based on plant physiology, can choose suitable crop planning and cultivation techniques* *- knows the core parameters for product quality and how to achieve different quality goals*	3					3 cr
NM13TT03	**• Basics of plant protection** *The student* *- know the most important varieties of weeds, plant diseases and pests that occur in Finland* *- perceives plant protection as a functioning whole and can choose appropriate preventative measures* *- is familiar with the effects of pesticides and can properly handle them so that neither the user nor the surrounding environment are harmed* *- understands and can apply current plant protection and chemical legislation*	3					3 cr
BE16GF	**Farm based studies** *The student* *- has performed practical work (75 internship days) during the cultivation season in a farm company with specialised or multifaceted production* *- can, in the form of an illustrated farm practice report, explain in detail and analyse the farm's plant and livestock production, machinery and buildings*	12					12 cr
NM13GF01	**• Plant production** *The student* *- can, in the form of an illustrated farm practice report, explain and in detail describe and analyse a farm company's plant production* *- can describe and analyse how a farm interacts with the surrounding environment taking into account various aspects*	3					3 cr
NM13GF02	**• Livestock production** *The student* *- can, in the form of an illustrated farm practice report, explain and in detail describe and analyse a farm company's livestock production*	3					3 cr
NM13GF03	**• Farm machinery and buildings** *The student* *- can, in the form of an illustrated farm practice report, explain and in detail describe and analyse a farm company's machinery and buildings*	3					3 cr
BE16GF01	**• The farm company's economic calculations** *The student* *- can calculate variable costs and make individual coverage contribution estimates for crop and livestock production at the farm level*	3					3 cr

	- has learned to translate the flow of material into financial results *- has learned to make total coverage contribution calculations without support* *- can efficiently use a farm company's own production data to perform basic economic calculations*						
BE16VGII	**Basics of plant production II**		9				9 cr
BE16VGII01	**• The supply of plant nutrients in soil** *The student* *- can use applied calculation methods in relation to the supply of nutrients (fertiliser calculations)* *- knows the importance of plant nutrients that are bound to the soil and can use the amount of nutrients as a basis for fertilisation calculations* *- understands how different plant nutrients are bound to the soil and what factors contribute to their activation*		3				3 cr
BE16VGII02	**• Mineral fertilisers** *The student* *- understands the nutrition needs of crops and can take measures to remedy nutritional deficiencies* *- knows the characteristics of mineral fertilisers marketed in Finland* *- can choose the most suitable fertiliser for a particular use, and can calculate the amount needed to satisfy an individual crop's needs in a single crop rotation* *- can take appropriate technical and strategic measures to optimise the utilisation of nitrogen and phosphate fertilisers*		3				3 cr
BE16VGII03	**• Organic fertilisers** *The student* *- is familiar with symbiotic nitrogen fixation and can assess its contribution to the nitrogen supply of subsequent crops* *- knows the composition and fertiliser value of manure and understands how different storage methods influence these parameters* *- can, based on knowledge of the risks of plant nutrient loss from manure at different stages of management, choose appropriate storage methods and spreading times* *- is familiar with the properties and effects of other organic fertilisers, such as sewage sludge, digestate, biocompost and fur animal manure* *- can perform expanded fertiliser calculations and can choose appropriate fertilisers*		3				3 cr
BE16HG	**Basics of livestock production**		9				9 cr
BE16HG01	**• Livestock feeding** *The student* *- has learned the basics of animal husbandry focusing on the chemical content of fodder and various feed components, including full feed mixes, based on the energy and nutrient needs of different animal species* *- understands the interaction between fodder and concentrate* *- can design suitable feed strategies and plan animal husbandry taking into account various factors influencing the interpretation of a feeding plan, and can evaluate the feeding plan* *- can use different feed optimisation programs, such as Kokompassen, and can perform simple daily calculations based on the economic value of the feed and milk in euro / cow / day*		3				3 cr
BE16HG02	**• Livestock health care** *The student* *- has learnt the basics of animal health with emphasis on disease prevention measures* *- understands what affects good animal health* *- knows the most common diseases in livestock and their symptoms* *- can take action when farm animals are taken ill*		3				3 cr
BE16HG03	**• Animal welfare and ethics** *The student* *- knows and applies animal welfare legislation with due regard to ethical requirements* *- has insight into the rules, requirements and restrictions that affect livestock production, including cross-compliance and livestock support, and how these affect production conditions* *- knows how to plan animal accommodation according to current animal welfare regulations*		3				3 cr
BE16EF	**Economic prerequisites**		12				12 cr
BE16EF01	**• Accounting and financial management** *The student* *- knows what is meant by good accounting ethics* *- can perform basic accounting and track the cash flow of natural resources* *- knows the requirements for tax accounting* *- is aware of the entrepreneur's obligations to report and pay VAT, employer contributions and statutory insurance* *- can evaluate a company's financial statements (balance sheet and income statement) and assess the need for changes in business strategy* *- knows the overall purpose of financial management* *- can perform and evaluate various cost and revenue analyses taking into account sustainability, profitability and efficiency* *- understands the importance of using key figures in evaluating a business*		3				3 cr

	- knows how to assess and take into account risks in a business *- can make an appropriate budget for a business*						
BE16EF02	**• Farm accounting and bookkeeping** *The student* *- has achieved in-depth competencies regarding special issues in agricultural accounting and* *- agricultural taxation, property taxation, Supreme Administrative Court decisions, corporate taxation and tax declarations* *- can use the most common agricultural data programs (Wakka)* *- can perform a practical performance analysis and convert a farm's tax accounts into a results analysis*		3				3 cr
BE16EF03	**• Market analysis and production support** *The student* *- has mastered basic economic concepts and understand how international agreements and regulations affect different types of rural enterprises in Finland* *- has acquired current knowledge of principles and regulations in relation to a farming company's production and environmental support* *- can perform a quadruple analysis (SWOT analysis) for a selected industry and has learned to reflect on how markets and policies affect the industry* *- attends, analyses and reports in writing on a compulsory rural policy seminar (SLC)*		3				3 cr
NM13LF02	**• Property law and valuation** *The student* *- has knowledge of regulations governing real estate* *- understands legislation affecting real estate* *- knows the requirements for real estate businesses* *- has knowledge of registration authorities and excerpts* *- has knowledge of property registration* *- recognises different forms of ownership* *- has knowledge of individual road management* *- students of agrology can evaluate farm real estate and those of forestry engineering can evaluate forest real estate*		3				3 cr
BE16FS	**Field-based studies**		6				6 cr
BE16FS01	**• Water economy in cultivated fields** *The student* *- understands the theoretical basics of water management of soil as well as the purposes of and approaches to drainage of cultivated land* *- can consider basic concepts and principles when planning drainage and the appropriate materials available* *- can decide on which types of soil and crops irrigation is most appropriate for and choose the appropriate techniques and irrigation procedures*		3				3 cr
BE16FS02	**• Applied cultivation technology in the field** *The student* *- knows practical details about the planning and management of field trials* *- can identify the most common weed species in cereal, oilseed, forage and sugar crops* *- can take stock of and assess the need for practical fertilisation and plant protection measures in fields during spring and early summer* *- has mastered basic plant protection technology and is knowledgeable about combine harvesters* *- knows specific regional conditions for rural entrepreneurship, in particular applied plant cultivation, in different parts of Finland and can analyse and report on a study trip in Finland*		3				3 cr
BE16BEI	**Bioeconomy I**			12			12 cr
BE16GE01	**• Bioeconomy Project** *The student* *- understands the concept of bioeconomics and its importance in Finland* *- is aware of the potential of natural resources to replace non-renewable products in the transition from linear to circular economics* *- knows the potential of natural resources in the production and sale of goods, services and experiences* *- knows the concepts of quality management and quality certification* *- in smaller project groups, is responsible for planning, implementing, evaluating and reporting seminars under the theme "Current issues in bioeconomics"* *- has deepened their knowledge within an area of bioeconomics of their choice* *- can broaden their knowledge of the theme through literature studies* *- can carry out an investigation/survey in their chosen subject area in smaller project groups, preferably in cooperation with the business community in the region in question* *- can compile a written report* *- can present project results to different audiences*			6			6 cr
BE16BEI01	**• Marketing and Sales** *The student* *- understands the importance of marketing in creating a network of customer relationships* *- can make an effective competition and customer analysis and establish a marketing strategy for a selected company* *- understands the importance of and the difference between external and internal marketing*			3			3 cr

	- can evaluate the marketing process and adapt it to a sales profile and the correct customer group *- knows the most important legislation regarding consumer and competition protection*						
CM16BI02	• **International Agriculture** *The Student* *- is familiar with development models in agriculture and model farms* *- is aware of the challenges of sustainability in a global perspective related to agriculture and climate change* *- is familiar with international agribusiness, food production, trade and quality systems like Global Gap* *- is knowledgeable in international agreements and trade barriers and their effect on agriculture*			3			3 cr
BE16BEII	**Bioeconomy II**				9		9 cr
NM13TT05	• **Bioenergy** *The student* *- knows different ways of organising energy supplies, taking into account renewable solutions and locally produced energy* *- can make financial calculations to assess the profitability of energy-saving measures, production and use of renewable energy* *- can assess the impact of different energy forms on carbon dioxide emissions*				3		3 cr
NM13NE05	• **Start your own company** *The student* *- knows the opportunities for self-employment and development that an entrepreneurial business can offer* *- knows the support offered for the start-up, acquisition and operation of business activities* *- knows which notifications and permits are required for a business* *- knows the overall differences between different types of companies* *- can draw up a business plan based on a business idea* *- can assess options and need for funding* *- knows the corporate network and support organisations in a market area* *- can assess the market and competitive situation in their own line of business*				3		3 cr
BE16EN01	• **Leadership and labour legislation** *The student* *- knows what management skills are required to operate a growing entrepreneurial business* *- knows different leadership styles and can judge their own leadership profile* *- knows how personal leadership is evaluated and developed* *- can consider how goals, motivations and conflicts affect interaction in groups* *- understands employer's responsibilities and obligations* *- is familiar with primary labour legislation for domestic and foreign workers*				3		3 cr
BE16GB	**Farm economy**				6		6 cr
BE16GB01	• **Investments and financing** *The student* *- knows about cash flows in a company and the factors that affect them* *- can compile a comprehensive financial plan with alternative production calculations for a farm company using available Excel calculation programs, and can calculate the profitability of various options* *- can set up budgets for farm companies and make investment calculations based on current investment and other business support rules* *- understands important payment movements and financing opportunities for rural businesses*				3		3 cr
BE16GB02	• **Operational planning** *The student* *- can organise an operating plan for a farm company* *- has an idea of what is meant by the sustainable use of farm resources and is familiar with the concept of farm view* *- can, based on coverage contribution estimates, performance planning, profitability analysis and key ratios, also known as green key figures, evaluate organic production options* *- has developed an understanding of generational shift processes in farm companies* *- understands how differences in a company's business ideas affect the entire business concept, e.g. how large-scale commodity production differs from the production of value added products* *- understand the principles for the development of services and service innovation in farm companies* *- can further develop entrepreneurship and new concepts, exploit the potentials of digitisation, and create relationships between industries*				3		3 cr
BE16FVA	**Optional further studies in plant production A** *An agrology student must individually complete a total of 30 credits of optional studies.* *Available elective studies in agricultural industries, in the form of optional in-depth studies in the field of plant and livestock production, comprise a total of 60 credits. These credits are allocated to the study units NM13VP13 Plant production (30 credits) with the courses NM13VP01 – NM13VP10, and NM13HP Livestock production (30 credits) with the courses NM13HP01 - NM13HP05.*			15			15 cr

	30 credits of either plant production or livestock production is recommended to support personal profiling, but courses within the two subjects can also be combined. *It is also possible, following standard criteria, to replace optional vocational studies with other vocational studies at the university or at other universities in Finland or abroad.* *The individual course choices regarding optional vocational studies are normally made in Winha.* *The elective further studies in the field of plant cultivation aim to combine basic knowledge with practical applications. Basic scientific understanding makes it possible on a case-by-case basis to plan and choose correct measures.* *In-depth knowledge of plant production is a prerequisite for the successful and responsible management of natural resources. Plant production requires an understanding of a crops' environmental requirements as well as the application of plant protection measures.* *Soil cultivation, plant nutrition and plant protection are all aspects of cultivation that must be considered in crop planning. Courses in crop planning, interdisciplinary subjects and field studies provide students with an understanding of the relationship between individual courses and different practical factors in plant cultivation*						
NM13VP01	• **Plant nutrient management** *The student* *- is aware of threats to agricultural production resources and can assess the contribution made by agriculture to environmental pollution* *- has gained insight into and understands causal relationships between flows, balances and losses of plant nutrition* *- can balance fields and farms and can identify risks of nutritional losses* *- can plan production systems and cultivation measures to minimise the risk of nutritional losses*			3			3 cr
NM13VP023	• **Cultivation systems and crop rotations** *The student* *- knows and understands different cultivation and crop rotation systems and how the crop sequence affects the nutritional supply of crops, the need for plant protection and the long-term fertility of the soil* *- can choose the appropriate crop rotation based on biological, ecological, technical, economic and social conditions, and can plan soil cultivation, fertilisation and plant protection so that these crop technology measures match the rotation* *- can plan the crop rotation so as to reduce the risk of nutritional losses and the need for direct control measures against weeds, plant diseases and pests* *- has the ability to make detailed plans and maps for farms supported by appropriate software (Web-WISU)*			3			3 cr
NM13VP03	• **Coarse feed** *The student* *- knows the significance and extent of fodder production in Finland* *- mastered the cultivation techniques of plant species used mainly for the production of fodder* *- is well acquainted with production techniques for the cultivation of perennial pastures, with alternative systems for grazing and methods of growing fodder or cereal crops* *- can control production efforts based on knowledge of how nutritional value is affected by environmental and cultivation factors*			3			3 cr
NM13VP04	• **Feedstuff preservation** *The student* *- can take appropriate measures when harvesting and storing fodder for optimal results from the production, biological and economical points of view*			3			3 cr
NM13VP05	• **Mechanical engineering** *The student* *- knows tractor technology, especially engine technology, hydraulics, transmissions and electronics* *- can handle different machine elements, including bearings and belts*			3			3 cr
BE16FVB	**Optional further studies in plant production B** *The optional further studies in the field of plant cultivation aim to combine basic knowledge with practical applications. Basic scientific understanding makes it possible on a case-by-case basis to plan and choose correct measures.* *In-depth knowledge of plant production is a prerequisite for the successful and responsible management of natural resources. Plant production requires an understanding of a crops' environmental requirements as well as the application of plant protection measures.* *Soil cultivation, plant nutrition and plant protection are all aspects of cultivation that*				15		15 cr

	must be considered in crop planning. Courses in crop planning, interdisciplinary subjects and field studies provide students with an understanding of the relationship between individual courses and different practical factors in plant production.						
NM13VP09	• **Oilseeds and grain crops** *The student* *- understands the different purposes of cultivating different oilseed and pulse crops* *- based on various plant physiological principles, can choose suitable crop planning and cultivation techniques* *- knows the core parameters for product quality and knows how to achieve different quality goals*				3		3 cr
NM13VP10	• **Potatoes and sugar beet** *The student* *- understands the different purposes of cultivating potatoes and sugar beet and, based on various plant physiological principles, can choose suitable crop planning and cultivation techniques* *- knows the core parameters for product quality and knows how to achieve different quality goals*				3		3 cr
BE16FVB01	• **Weeds** *The student* *- can identify weeds that occur in field crop cultivation in Finland and knows their life cycles and methods of dissemination* *- can take preventive measures and assess the threshold for regulatory measures* *- can plan and perform physical and chemical plant protection measures*				3		3 cr
NM13VP07	• **Plant diseases** *The student* *- can identify plant diseases that occur in field crop cultivation in Finland and knows their life cycles and methods of dissemination* *- can take preventive measures and assess the threshold for regulatory measures* *- can plan and carry out direct plant protection measures* *- understands and can use growth regulating preparations*				3		3 cr
BE16FVB02	• **Pests** *The student* *- knows the plant parasites nematodes, the pests and the viruses that occur in field crop cultivation in Finland and knows their life cycles and methods of dissemination* *- can take preventive measures and assess the threshold for regulatory measures* *- can plan and carry out direct plant protection measures*				3		3 cr
BE16FHA	**Optional further studies in livestock production A** *An agrology student must individually complete a total of 30 credits of optional studies.* *Available elective studies in agricultural industries, in the form of optional in-depth studies in the field of plant and livestock production, comprise a total of 60 credits. These credits are allocated to the study units NM13VP13 Plant production (30 credits) with the courses NM13VP01 – NM13VP10, and NM13HP Livestock production (30 credits) with the courses NM13HP01 - NM13HP05.* *30 credits of either plant production or livestock production is recommended to support personal profiling, but courses within the two subjects can also be combined.* *It is also possible, following standard criteria, to replace optional vocational studies with other vocational studies at the university or at other universities in Finland or abroad.* *The individual course choices regarding optional vocational studies are normally made in Winha.* *The optional further studies in the field of livestock production aim to combine basic knowledge with practical applications. Basic scientific understanding makes it possible on a case-by-case basis to plan and choose correct measures.* *In livestock production and ethics, students should specialise in different animal species so that they deepen their knowledge of different branches of production and factors that influence production. Students should know and understand the natural behaviour of livestock and how this affects the methodology of animal husbandry and productivity.*			15			15 cr
BE16FHA01	• **Milk production** *The student* *- understands the demands of dairy cows on their production environment, feeding and care* *- knows which factors affect the results of milk production and can optimise them* *- knows how dairy farm production facilities should be designed to be efficient, effective and humane*			3			3 cr

	- understands how feeding, accommodation and calving intervals affect the fertility of dairy cows and are aware of osteoporosis, fertility disorders and fertility treatments						
BE16FHA02	**• Dairy and beef production** *The student* *- understands the requirements of dairy and meat animals in their production environment, feeding and care, with emphasis on differences in milk cows, including the goals of feeding and different slaughter classes* *- knows which factors affect the performance of dairy and beef production and can optimise them* *- knows how production facilities for dairy and meat should be designed to be efficient, effective and humane with an emphasis on differences in dairy herds*			3			3 cr
BE16FHA03	**• Livestock technology** *The student* *- can apply knowledge of farm mechanisation and standard feeding, milking, ventilation and fertilisation systems in Finnish animal farms, primarily from dairy, milk and livestock herds* *- knows how to build modern animal accommodation and has obtained applicable knowledge and practical skills for rational farm planning*			3			3 cr
NM13HP03	**• Pig production** *The student* *- understand the factors that affect the profitability of swine production* *- knows the demands of swine on their production environment* *- knows how to manage the care of swine for slaughter and the production of piglets* *- can optimise swine production*			6			6 cr
BE16FHB	**Optional further studies in livestock production B** *The optional further studies in the field of livestock production aim to combine basic knowledge with practical applications. Basic scientific understanding makes it possible on a case-by-case basis to plan and choose correct measures.* *In livestock production and ethics, students should specialise in different animal species so that they deepen their knowledge of different branches of production and factors that influence production. Students should know and understand the natural behaviour of livestock and how this affects the methodology of animal husbandry and productivity.*				15		15 cr
BE16FHB01	**• Livestock breeding** *The student* *- understands and can apply the basics of animal husbandry with emphasis on breeding and heritability* *- has become acquainted with current breeding methods for swine and cattle* *- understands the terms genotype and gene frequency and how they affect breeding results, and can realise the benefit of test pairs*				3		3 cr
BE16FHB02	**• Sheep farming** *The student* *- understands factors that affect sheep farming's profitability* *- knows the requirements that sheep impose on their production environment and care in wool and meat production* *- can optimise sheep production based on prevailing factors and requirements*				3		3 cr
BE16FHB03	**• Poultry production** *The student* *- understands the factors that affect poultry production's profitability* *- knows the requirements that poultry place on their production environment and care as eggs and chickens respectively* *- can optimise poultry production based on prevailing factors and requirements* *- is aware of factors that affect hatching and breeding*				3		3 cr
BE16FHB04	**• Horsekeeping** *The student* *- understand the factors that affects horse breeds, mainly based on exterior and movement patterns* *- knows the requirements that riding and trotting horses place on their surroundings, their facilities and their feeding and care* *- understands the impact of the environment on a horse's conduct and can prevent problematic behaviour* *- can optimise horse breeding and understands the factors that affect the profitability of horse breeding and related businesses* *- is familiar with commonly used riding and trotting training methods*				6		6 cr
Val	**Elective studies** *Examples of courses that can be chosen as part of optional studies are:* *- NM13VL01 Small-scale wood processing 3 credits* *- NM13VL02 Agricultural field trip 1 credit* *- NM13VL03 Project - participation at a trade fair 2 credits*						9 cr

	- NM13VL04 Agricultural field trip 2 credits *- NM13LS01 Social planning 3 credits (recommended optional course)* *The operation of the above-mentioned courses is in most cases dependent on group size and financial conditions. Contact the relevant professor for further information.*	
Pra	**Internship** *A specialised internship is a compulsory part of the agrology degree. It is central to a student's individual professional profile and should be linked to individually chosen and approved vocational studies.* *The student* *- can perform an approved internship and report in writing about core tasks in the relevant industry* *- understands and can explain in writing how the organisation and its economy is structured and functions* *- can explain the relationship of the internship and workplace to its surroundings, for example regarding current networks and the region's agricultural production*	30 cr
EXA	**Thesis** *The thesis is part of the student's personal proficiency profile. The student obtains an in-depth professional qualification by carrying out investigations or research work within their field of study. An individual written matriculation test is conducted which demonstrates familiarity with the subject area of the thesis and the language proficiency of the student.* *The student* *- can apply theoretical models to practical issues* *- can create a system of tripartite collaboration where students, the university of higher education and industry organisations together develop products, systems or create new knowledge* *- can, in a structured manner, report results in the implementation of a research plan* *- can, in a structured manner, at a seminar, present and explain the formulation and purpose of the thesis work, present and explain material and method selection, and present, analyse and discuss results.*	15 cr