# MSc European Forestry
## ERASMUS MUNDUS

**A two-year Erasmus Mundus Joint Master's Degree Programme (EMJMD)**



## ACADEMIC STUDY GUIDE 2019–2021

University of Eastern Finland

AgroParisTech, France
University of Lleida, Spain
University of Freiburg, Germany
Transilvania University of Braşov, Romania
University of Natural Resources and Life Sciences, Vienna, Austria



Funded by the
Erasmus+ Programme
of the European Union

ACADEMIC STUDY GUIDE 2019–2021

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# FOREWORD

**Welcome to our MSc European Forestry Erasmus Mundus programme!**

MSc European Forestry is a unique, multicultural master's degree Erasmus Mundus programme in Europe. It aims at providing you insight into the various practices, administrative characteristics and state-of-the-art technologies of the contemporary forest cluster.

Forestry is a multidisciplinary field of science where the MSc European Forestry programme takes you on an exciting journey throughout Europe. It highlights the importance of urban forestry, introduces you to the applications of multiple uses of forests, and teaches you the practices in mountain forestry as well as in technologies used in the production-oriented forest industry. The variety of subjects within European Forestry allows you to choose the studies that best suit your ambitions. Throughout the studies, our professional teaching personnel are committed to supporting your learning process towards a scientific way of thinking.

I am proud to act on behalf of our MSc EF Consortium that jointly provides the best knowledge in European Forestry today! On behalf of all the Partners, I congratulate you and wish you all the best for your two-year studies!

Professor Timo Tokola,
Coordinator of the MSc European Forestry programme

# ERASMUS MUNDUS AND EUROPEAN UNION

**The Erasmus Mundus programme**

Erasmus Mundus (EM) is a cooperation and mobility programme in the field of higher education which promotes the European Union as a centre of excellence in higher education. It supports European top quality master's courses (EMJMD) and doctorate programmes (EMJD) and enhances the visibility and attractiveness of European universities. MSc European Forestry was awarded the title of Erasmus Mundus programme in 2004–2008, 2009–2013 and again in 2016–2021.

The first cohort of the Erasmus Mundus students started in 2004. Since then, over 12,000 students have been selected for the 100 different master's courses that are currently offered. The EM disciplines vary from humanities to space science and technology, and among them, the MSc in European Forestry stands as the only one in the field of bioeconomy and forest sciences.

**The European Union**

As stated on the European Union website (http://www.europa.eu), the European Union (EU) is a family of 28 democratic European countries, committed to working together for peace and prosperity. The member states have set up common institutions to which they delegate some of their sovereignty so that decisions on specific matters of joint interest can be made democratically at the European level.

Initially, the EU consisted of just six countries: Belgium, Germany, France, Italy, Luxembourg and the Netherlands. Denmark, Ireland and the United Kingdom joined in 1973, Greece in 1981, Spain and Portugal in 1986, Austria, Finland and Sweden in 1995. In 2004 the biggest ever enlargement took place with 10 new countries joining: Estonia, Latvia, Lithuania, Malta, Czech Republic, Slovakia, Poland, Slovenia, Hungary and Cyprus. In 2007, Romania and Bulgaria joined the Union. Croatia became the 28th EU member country on 1 July 2013.

# The European Union



Member States of the European Union (2013)

Candidate and potential candidate countries

Source: www.ec.europa.eu

For more information:

https://europa.eu/european-union/index_en

http://ec.europa.eu/programmes/erasmus-plus/opportunities-for-individuals/students/erasmus-mundus-joint-master-degrees_en

# PROGRAMME DESCRIPTION

The Master of Science in European Forestry (MSc EF) is a master's degree programme provided by a consortium of six well-known European universities. The MSc EF is an international double-degree programme, which is acknowledged as a top-quality European MSc under the Erasmus Mundus programme by the European Commission.

MSc EF is an interdisciplinary programme that provides academic education in the field of sustainable resource management with a special emphasis on bioeconomy. MSc EF offers a new approach to the markets in forestry and nature management and it connects the increasing number of forest-related issues with a European dimension at international as well as national levels.

The objective of the MSc EF programme is to educate professionals who have a thorough understanding of sustainable forest bioeconomy as well as in European business culture.

# CONSORTIUM

In MSc EF, six European top-class forestry universities collaborate intensively to offer joint study modules in addition to their existing curricula.

The MSc EF Consortium consists of the following *Full Partners*:
- University of Eastern Finland (coordinator)
- AgroParisTech, France
- University of Freiburg, Germany
- University of Lleida, Spain
- University of Natural Resources and Life Sciences Vienna, Austria
- Transilvania University of Brasov, Romania

In addition, MSc EF Consortium includes the following *Associated Partners:*

*Associated Partner universities:*
- Federal University of Paraná, Brazil
- Northwest A&F University, China
- São Paulo University, Brazil
- University of British Columbia, Canada
- University of New Brunswick, Canada

*Associated Industrial and Scientific Partners:*
- Arbonaut Ltd., Finland
- Centre Tecnològic Forestal de Catalunya, Spain
- Chinese Academy of Forestry, China

- District Forest Office (Forstamt) Johanniskreuz, Germany
- European Forest Institute, Finland
- EFICEEC-EFISEE, Austria (belongs to BOKU)
- International Institute for Applied Systems Analysis (IIASA), Austria
- Office National des Fôrets (ONF), France
- Stora Enso Wood Supply, Finland

The University of Eastern Finland is the coordinator of MSc EF, but all the *Full Partners* are providing courses in English and in national languages, and fully recognise the studies provided by the other partners within this study programme. In addition, *Associated Industrial and Scientific Partners* offer applied period placements and MSc thesis topics for the MSc EF students.

# DESCRIPTIONS OF THE FULL PARTNERS

## University of Eastern Finland, FINLAND

The Universities of Joensuu and Kuopio merged on 1 January 2010 to constitute the University of Eastern Finland. With approximately 15,500 students and 2,500 members of staff, the University of Eastern Finland is one of the largest universities in Finland. The university has campuses in Joensuu and in Kuopio. The four faculties of the University of Eastern Finland, i.e., the Philosophical Faculty, the Faculty of Science and Forestry, the Faculty of Health Sciences, and the Faculty of Social Sciences and Business Studies, offer teaching in more than 100 major subjects.

The School of Forest Sciences situated in the Joensuu campus belongs to the Faculty of Science and Forestry. It is one of the university's flag-ships as a centre for international education and research. More than 100 international students study at the school annually, which is a significant number for a school with an annual intake of about 70 degree-students. The School coordinates the MSc EF programme, the MSc in Forestry programme of the Finnish-Russian Cross-Border University (CBU) and the MSc in Wood Materials Science, and participates in the EU-Canada programme: the Transatlantic Forestry Master (TransFor-M) and offers a non-degree International Study Programme in Environmental Sciences and Forestry.

For more information:
www.uef.fi/uef/english, www.uef.fi/en/web/forest

## AgroParisTech, FRANCE

AgroParisTech was founded in 2007 by the merger of three existing French engineer schools: INA P-G, ENSIA and ENGREF. It has activities in the fields of agronomy, forestry, environment, life sciences and food technology. It has the following three primary missions: (I) to train master of engineering, master of science and doctoral students, (II) to contribute to the advancement of scientific knowledge through fundamental and applied research, and (iii) to develop international relations to enhance the career prospects of the graduates. AgroParisTech has 300 scientists in 33 laboratories and 450 PhD students.

Within AgroParisTech, the campus of Nancy is in charge of the education in forestry at the master/engineer and doctoral levels, and of the post-master programme for the training of high level managers for the public and private sectors. Forestry training and research mainly take place on the Nancy campus, with contributions from two other AgroParisTech campuses in Montpellier (southern France) and Kourou (French Guyana). The Nancy campus is a host to 36 scientists and presently receives circa 200 students per year. AgroParisTech's close partners in Nancy, INRA (French National Institute

for Agricultural Research), R&D department of Office National des Forêts (manager of French public forests), IGN (National Forest Inventory) and the Université de Lorraine participate in the *Erasmus Mundus* master in forestry. With its local partners in higher education in Nancy, AgroParisTech runs the Nancy doctoral school called "Science et Ingénierie des Ressources Naturelles" (Science and engineering of natural resources, SIRENA) in the frame of which a PhD in tree biology, forest ecology or forest resource assessment can be prepared.

For more information:
www.agroparistech.fr

# University of Freiburg, GERMANY

The Faculty of Environment and Natural Resources is located in Freiburg, a traditional and at the same time dynamic university town of 220,000 inhabitants. The main focus of the faculty is the interaction between environment and society. Natural sciences, social sciences, and technical competences serve as a foundation for a wide-ranged, interdisciplinary approach to research and education. The faculty - which has 1,500 students - offers four bachelor's and eight master's programmes in the field of forest and environmental sciences. There are also 250 PhD students.

The MSc European Forestry students can choose studies from the MSc Forest Sciences/Forstwissenschaften programme. This specialisation focuses on the sustainable management of natural resources, with a particular focus on forested landscapes. Courses generally yield 5 ECTS credits each, with a duration of three weeks. A course usually comprises lectures, practicals, tutorials, preparation, reading, independent learning and assessment.

The Faculty has a strong network with other academic institutions within Europe and overseas, such as the EU-Canada programme Transatlantic Forestry Master's (Transfor-M) or the NFZforestnet, a cooperation between Nancy, Zürich and Freiburg.

For more information:
www.msc-forst.uni-freiburg.de

www.iww.uni-freiburg.de/teaching/international-teaching-networks

www.uni-freiburg.de

# University of Lleida, SPAIN

The University of Lleida is a public institution with approximately 9,650 students and 750 faculty members. The 44 highly competitive research groups receive resources both from national research financing agencies and from the European

Union. The UdL has long been involved with other universities and institutions through international networks (ASEFOREP, NATURA, SILVA, ICA, IROICA, ECHAE) and in the framework of international EU student and teaching staff mobility programmes (ERASMUS). Looking to the future, the UdL accepts the challenging task of training competent open-minded citizens who are sensitive to other cultures and to the peculiarities that these cultures involve.

The UdL is made up of seven faculties and schools, including the Higher Technical School of Agrarian Engineering (ETSEA). The ETSEA is a Spanish leader for teaching and research in the Agronomy, Food Technology and Forestry areas and regarding the last is specialised in Mediterranean forestry, forest protection and non-wood forest products. Forest Science studies are taught in the ETSEA campus, where a complete infrastructure for study and personal work is provided (libraries, study and computer rooms open all day, laboratories, greenhouses, practice fields, virtual campus and access to teaching resources for the courses). All courses and programmes are designed according to the European Higher Education Area (EHEA) project, and many courses in English are available (and increasing) for the MSc EF students.

For more information:
www.europeanforestry.udl.cat

# University of Natural Resources and Life Sciences, Vienna (BOKU), AUSTRIA

The University of Natural Resources and Life Sciences, Vienna, also known by the acronym 'BOKU', comprises 15 departments including Forest and Soil Sciences and four service centres in Vienna. The university has approximately 12,000 students (of which 20 per cent are international), provides courses at the bachelor's, master's and doctoral levels, has approximately 700 scientists employed on a project basis, about 74 full professors and about 130 associate professors.

The university sees itself as a teaching and research institution that focuses on renewable resources that are a prerequisite for human existence. The relationships between man, society and the environment form the basis of all activities, and its foremost aim is to make decisive contributions to securing the well-being of future generations. In this endeavour, it will seek ways of ensuring a sustainable and environmentally sound management of natural resources by allying the competences of the natural, engineering, economic and social sciences. BOKU offers 27 national and international master's programmes, whereas the Master of Mountain Forestry has been successfully established and is attracting students around the world. Altogether, BOKU offers 48 master's courses in the field of forest sciences which are entirely taught in English and is actively involved in a wide range of international educational projects (EM, EM ECW, TEMPUS…).

For more information:
www.boku.ac.at
http://www.boku.ac.at/en/universitaet-fuer-bodenkultur-wien-boku/studieren-an-der-boku/themen-fuer-studierende/internationales/international-students-coming-to-boku/

# Transilvania University of Braşov, ROMANIA

Founded in 1948, Transilvania University of Brasov is one of the largest universities in the country and the best reputed higher education institution in the central region of Romania. It has 18 faculties, over 19,200 students and more than 1,250 permanent staff members. The faculties offer academic degree programmes in a wide range of fields (from different engineering and science domains to economic and social sciences, humanistic sciences, medicine and music).

The forestry section was established in 1948. At present there are three BSc programmes of study (Forest management, Forest engineering and Wildlife management) and two MSc degree programmes (Forest ecosystem management and Technical systems and management in forest engineering). A new master's degree programme in English will be launched in autumn 2017. The faculty of forestry is involved in basic and applied research and has strong partnerships with forest administrations, harvesting and primary wood processing companies.

For more information:
www.unitbv.ro/en/Home.aspx
www.unitbv.ro/silvicen/AboutFaculty.aspx

# DESCRIPTIONS OF THE ASSOCIATED PARTNER UNIVERSITIES

## Federal University of Paraná, BRAZIL

Federal University of Paraná (UFPR) was established in 1912. Currently UFPR has 101 undergraduate and 90 postgraduate courses in almost all areas of knowledge. The university enrolment is around 30,000 students, with 2,200 faculty members. UFPR is a public university with eight campuses in the city of Curitiba and other municipalities of the State of Paraná. Currently the University has close cooperative relations with about 110 universities of different countries. The internationalisation plan takes on the account policy to integrate the university into the various existing international research networks as well as establishes and strengthens international research network in interdisciplinary research areas, where there are substantial needs from the viewpoint of human society in a globalised world. Forest engineering course offered by UFPR is a hybrid of engineering, forestry, and management. Forest engineers are unique professionals who can combine skills to produce ecosystems services (supporting, provisioning, regulating and cultural), with a focus on the forested landscape.

For more information:
www.ufpr.br/portalufpr

## Luiz de Queiroz College of Agriculture, University of São Paulo, BRAZIL

The Luiz de Queiroz College of Agriculture (USP/ESALQ), located in Piracicaba, São Paulo, is one of the 42 academic units of the University of São Paulo (USP).  This college, which is made up of 250 faculty members, offers seven undergraduate programmes and 13 graduate programmes, in addition to one international, one inter-institutional and two inter-unit programs. It contributes to undergraduate and graduate areas of agricultural, applied social and environmental sciences. Forest Sciences Department develops activities in the areas of forestry; forest management; applied ecology and technology of forest products, in order to assess, plan and manage a sustainable use and conservation of forest resources, taking into account environmental, social and economical aspects.  It is responsible for the undergraduate and postgraduate programmes in forest resources, and provides undergraduate disciplines for Agriculture, Environmental Management and Biological Sciences courses.

The research projects are developed in partnership with the main Brazilian private forest companies and in its own two experimental stations with 2,910 ha (Itatinga and Anhembi Forest Research Stations).

For more information:

## Northwest A&F University, CHINA

Northwest A&F University (NWUAF), located in Yangling, Shaanxi Province, the birthplace of Chinese agricultural civilisation, is a key national comprehensive university directly under the administration of the Ministry of Education. As one of the leading universities in China, NWUAF is supported by the Ministry of Education's *Project 985* and Project 211 and is characterised by its integration of education, research and social services. Currently there are 2,048 full time teachers among 4,498 staff members. A complete range of study programmes is now available for undergraduates, master's, Ph.D. and post-doctoral studies. There are currently over 21,000 full-time undergraduate students, 7,300 postgraduates (5,400 masters and 1,900 doctoral students) and over 9,000 adult education students. In 2006, the university received approval to recruit international students funded by Chinese government scholarships.

The College of Forestry was reformed on the basis of the amalgamation of former separate institutes and offers for students four undergraduate programmes: forestry, forest protection, chemical engineering of forest product, wood sciences and engineering; eight master's programmes, namely, ecology, silviculture, forest protection, tree genetics and breeding, forest management, protection and utilisation of wild animals and plants, chemical engineering of forest products, and wood sciences and technology; and similar Ph.D programmes offered except chemical engineering of forest products and wood sciences and technology. There are 188 teaching and research staff currently, alongside with 12 sci-tech innovation platforms through ministerial or provincial level support, 7 experimental stations (bases) and 2 nurseries for experiments and teaching.

For more information:

## University of British Columbia, CANADA

The University of British Columbia is a global centre for research and teaching, consistently ranked among the 40 best universities in the world. Since 1915, UBC's West Coast spirit has embraced innovation and challenged the status quo. Its entrepreneurial perspective encourages students, staff and faculty to challenge convention, lead discovery and explore new ways of learning.

UBC's forest education is keeping pace with changing social values and an increasingly knowledge-based forest sector. The Faculty of Forestry offers both master's and doctoral programmes in which our graduate students learn from a dynamic and diverse group of researchers who educate and communicate how

forests and the products that are created from them contribute to the well-being of all living things. The health and sustainability of forests underlies everything we do.

UBC is among the best institutions globally in forest-related education and research, and is also unique in the breadth of expertise it possess, which allows it to integrate new knowledge across many disciplines. UBC's mandate is the advanced training of tomorrow's scientists and leaders.

For more information:
www.forestry.ubc.ca/
www.grad.ubc.ca/prospective-students/faculties/faculty-forestry

# University of New Brunswick, CANADA

Founded in 1785, UNB offers undergraduate and graduate degrees in more than 60 disciplines and continuing education in a variety of fields.

Campuses are located in two New Brunswick cities: Fredericton and Saint John. Fredericton, the provincial capital, was named one of the Top 7 Intelligent Communities by the New York-based Intelligent Communities Forum. Saint John, New Brunswick's financial and industrial centre, is emerging as an energy hub for the Eastern Seaboard.

UNB has among the best student-to-faculty ratios of Canada's comprehensive universities, according to Maclean's magazine. It offers world-class programmes while maintaining a small-university experience.

The Faculty of Forestry & Environmental Management offers two undergraduate degree options. The Bachelor of Science in Forestry (BScF) degree allows for an Urban Forestry Major, and the Bachelor of Science in Environment & Natural Resource (BScENR) degree allows for a major in environmental management, water resource management, or wildlife conservation. It also offers course-based Masters of Environmental Management (MEM) and of Forestry (MF), a thesis-based Master of Science in Forestry (MSc.F), a thesis-based Master of Science in Environmental Management (M.Sc.EM), and a Ph.D.

For more information:
www.unb.ca/
www.unb.ca/fredericton/forestry/

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http://www.unr.uni-freiburg.de/en/studies-and-instruction/academic-advising-office?set_language=en
http://www.msc-forst.uni-freiburg.de/en/people-and-places/contact

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# STUDIES

## DEGREES AWARDED

Each student is awarded, upon completion of the MSc programme, a double-degree certificate and diploma supplements by two of the MSc EF Full Partner Universities: the two degree-awarding universities are the University of Eastern Finland, and the MSc EF Full Partner University where the student carries out the second year of studies.

**MSc EF degrees awarded by the Full Partners**

| University | Degree |
|---|---|
| University of Eastern Finland **(the coordinating institution)** | MSc (Agriculture and Forestry) with major in European Forestry |
| University of Lleida, Spain | Master of Science Erasmus Mundus in Spatial and Ecological Modelling in European Forestry |
| University of Freiburg, Germany | MSc Forest Sciences |
| University of Natural Resources and Life Sciences, Vienna, Austria | MSc European Forestry |
| AgroParisTech, France | Master in Agrosciences, Environment, Territories, Landscape, Forest, specialisation "Forests and their environment (FEN)" |
| Transilvania University of Braşov | Master in Forestry |

# PROGRAMME STRUCTURE, GRADING AND RPL

**Programme structure**

The MSc EF programme consists of 120 ECTS of obligatory and elective studies provided at the different partner universities. The structure of the programme is designed so that the students deepen their understanding in the diverse aspects of forest sciences with regard to selected study tracks of decision support systems for resource management, resource management for ecosystem services, spatial and ecological modelling, resource economics and policy and silviculture and engineering.

The **first year** provides students with a complete background in European forestry while familiarising them with the consortium universities and with other forest organisations. During the first year of the programme, students attend most of the compulsory courses of the MSc EF, which are mostly organised at UEF. Additionally, during the first year, students are required to carry out the applied period (practical training) at a forest institution.

During the **second year**, students specialise in their fields of interest by taking obligatory and elective courses and carrying out the master's thesis at one of the partner universities (not possible at UEF) according to an individual study plan agreed upon by the study advisors. For the second year, each partner university (not UEF) offers an equal number of study places aiming at even student distribution among the partner universities. Although, students' preferences for their second-year host university are taken into account, the coordinators of the consortium will make the final student selection among the consortium universities (self-paying students may choose their second-year university freely taking into account the possible restrictions mentioned in the letter of admission). Also there might be restrictions or additional supplementary studies required for some students.

The work-load of each course is calculated according to the ECTS (European Credit Transfer and Accumulation System), which is the pan-European credit system. Generally one ECTS credit corresponds to 27 hours of student's work. Find out more about ECTS at http://ec.europa.eu/education/index_en.htm

# MSc EF programme structure

| 1. YEAR 60 ECTS | Academic year 2019/2020: Obligatory and elective studies | Credits (ECTS) | Location |
|---|---|---|---|
| Aug-Apr | **Module 1**<br>Trends in European forestry<br>Academic skills in forest sciences<br>Research methodology in forest sciences<br>Global virtual seminar | 5<br>1.5<br>3.5<br>2 | Joensuu, Finland |
| May-July | **Module 2**<br>European forestry field course<br><br>Applied period in forest institutions | 8<br><br>10 | Spain, France, Germany, Austria and Romania<br>Preferred Consortium country |
| Sep-Apr | **Elective courses** | 30 | Joensuu, Finland +<br>online courses |
| 2. YEAR 60 ECTS | Academic year 2020/2021: Obligatory and elective studies, Master thesis | Credits (ECTS) | Location |
| Autumn & spring semester | **Module 3**<br>Obligatory and elective courses<br>Master's thesis and thesis seminar (online)<br><br>European forestry forum and graduation ceremony | 30<br>30<br><br><br>0 | MSc EF partner university according to the student's<br>individual study track (not UEF)<br><br>Joensuu, Finland |

## Grading

Grading of courses in MSc EF follows two basic practices: 1) Pass or Fail, or 2) a numerical scale with grading systems of the participating universities (see the grade conversion table below) for passed courses. The performance of each student is compared to the goals of the course. If you wish to discuss the principles of the assessment, please do so at the very beginning of the course. The first course meeting with the teacher is the right place to ask these questions.

The studies completed are saved in the Oodi system of the University of Eastern Finland and in the corresponding system of the second-year host university. A transcript of Academic Records is the document listing all the courses the student has completed. Please note that failed or other non-completed courses are not shown in the UEF transcript. The student can use WebOodi for checking the completed courses.

Courses are graded using the grades described in the table below.

| ECTS | AgroParisTech | ALU | BOKU | UoL | UTBv | UEF |
|------|---------------|-----|------|-----|------|-----|
| A | ≥17 | 1.0-1.6 | 1 | 9-10 | 10 | 5 (excellent; 90-100% correct) |
| B | ≥15<17 | 1.7-2.6 | 2 | 8 | 9 | 4 (very good; 80-89% correct) |
| C | ≥13<15 | 2.7-3.6 | 3 | 7 | 7-8 | 3 (good; 70-79% correct) |
| D | ≥11<13 | 3.7-3.9 | 4 | 6 | 6 | 2 (satisfactory; 60-69% correct) |
| E | ≥10<11 | 4.0 | 4 | 5 | 5 | 1 (sufficient; 50-59% correct) |
| FX | <10 | 5 | 5 | 4 | 4 | 0 (fail; <49% correct) |
| F | <10 | 5 | 5 | 0-3 | 1-3 | 0 (fail; <49% correct) |

## Recognition of prior learning (RPL)

In case students have completed studies in some other higher education institution(s) before their MSc EF studies and in case those studies are not included in their previous degree(s), students can apply for substitution of studies on the basis of prior studies. Similarly, in case students have non-formal prior-learning (e.g. employment or training), students can also apply for substitution of studies. However, for EMJMD scholarship holders there are some restrictions. Students can discuss about the possible substitution of studies with the study advisors of their first and second year host university when drafting their personal study plans.

For more information:

www.uef.fi/en/studies/recognition-of-prior-learning

# STUDY SCHEDULE 2019-2021

## First Academic Year (2019/2020), 60 ECTS

### Autumn semester

| Aug | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | | | | | Intro | | | | | Trends in European Forestry (5 ECTS) | | | | | | | | | | | | | | | | | | | |

| Sep | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | UEF orientation | | | Module 1 and elective courses* | | | | | | | | | | | | | | | | | | | | | | | | | |

| Oct | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

| Nov | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

| Dec | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | | | | | | | | | | | | | | | | Christmas holiday | | | | | | | | | | | | | |

### Spring semester

| Jan | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | | | | Module 1 and elective courses | | | | | | | | | | | | | | | | | | | | | | | | | |

| Feb | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | | |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | Module 1 and elective courses | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| March | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | Module 1 and elective courses | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Apr | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | | | | | | | | | Easter holiday | | | | | Module 1 and elective courses | | | | | | | | | | | | | | | |

| May | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | Module 2: European Forestry field course (8 ECTS) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| June | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | Module 2: Applied period (10 ECTS) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| July | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | Module 2: Applied period (10 ECTS) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

*Elective courses: During the period September-April, students must complete a min. of 30 ECTS in elective courses (the list of courses is provided separately on p. 32-33).

# Second Academic Year (2020/2021), 60 ECTS

## Autumn semester

| Aug | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Sep | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Oct | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Nov | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Dec | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3 | | | | | | | | | | | | | | | | | | Christmas holiday* | | | | | | | | | | | | |

## Spring semester

| Jan | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (holiday) | | | | | Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | |

| Feb | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| March | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Apr | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Easter holiday* | | | | | | | Module 3 | | | | | | | | | | | | | | | | | | | | | | | |

| May | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| June | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| July | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Aug | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Graduation ceremony and European Forestry Forum* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

*Starting dates vary from the end of August to the beginning of October, depending on the partner university. Also the timing of the holiday seasons and graduation times may vary depending on the partner university. The exact date for the Graduation ceremony and European Forestry Forum will be announced in spring 2021.

# COURSE LIST 2019-2021

**Modules**

|  | **ECTS** |
|---|---|
| **Module 1** | 12 |

| | |
|---|---|
| 3513157 Trends in European forestry | 5 |
| 3513061 Academic skills in Forest Sciences | 1.5 |
| 3513148 Research methodology in forest sciences | 3.5 |
| 3513154 Global virtual seminar | 2 |

**Elective courses**

<u>Autumn semester</u>

| | |
|---|---|
| 3513144 Analysis in forest economics and policy | 6 |
| 3513142 Basics of wood material science | 4 |
| 3513175A Carbon dynamics of forest soils (field course) | 3 |
| 3513127 Current issues in forest conservation and biodiversity | 3 |
| 3513040 Economics of multiple-use forestry | 3 |
| 3513057 Fibrous products | 5 |
| 3513170 Forest ecosystem modelling, concepts and applications | 2-5 |
| 3513165 Foresight methods and applications for the forest sector | 5 |
| 3513044 Forestry in Russia | 5 |
| 8020270 Information skills and sources in science and forestry for international students | 1 |
| 3513149 Intensive forest management and production of forest biomass | 3 |
| 3513129 Supply and energy use of lignocellulosic biomass | 6 |
| 8031003 University study skills | 1 |

<u>Spring semester</u>

| | |
|---|---|
| 3513028 Advanced geographical information systems | 5 |
| 3513029 Advanced remote sensing | 5 |
| 3513019 Bioenergy markets and policies | 6 |
| 3510011 Data-driven qualitative methodologies for forest scientists and foresters | 5 |
| 3513011 Forest zoology | 4-6 |
| 3514017 Industrial forest biotechnology and biorefining | 6 |
| 3513135 Innovation management | 4 |
| 3513151 International forest governance and environmental policy | 5 |
| 3513123 Nutrient dynamics in forest ecosystems | 4 |
| 3513147 Perspectives to bioeconomy | 6 |
| 3513070 Principles of scientific inquiry in forest ecology and biodiversity research | 3 |
| 3513159 Structure and properties of wood-based materials | 5 |

<u>All year</u>

| | |
|---|---|
| 3513175B Carbon dynamics of forest soils (literature exam) | 4 |

| | |
|---|---|
| 3513174 Forest health management | 3 |
| 3513168 Timber transportation | 3 |
| <u>Online courses provided by the University of Lleida (Spain)</u> | |
| Forest dynamics in a global change context: drivers, processes and modelling approaches | 5 |
| Introduction to Spatial Statistics: Spatial analysis with R | 5 |
| Stand to Continental Forest Health Management | 5 |
| **Module 2** | **18** |
| 3513073 European forestry field course | 8 |
| 3513158 Applied period in forest institutions | 10 |
| **Module 3** | 60 |
| Advanced Courses | 30 |
| 3513154 Master's Thesis | 30 |
| 3513075 MSc European forestry thesis seminar | 0 |
| European forestry forum – Job fairs and graduation ceremony | 0 |
| **min.** | **120** |

# COURSE DESCRIPTIONS

## Module 1
**3513157 Trends in European forestry (5 ECTS)**
**Learning outcomes**
Upon successful completion of this course the students should be able to describe the essential features regarding history of forests and land use in Europe; account for the basic conditions for forestry as well as the present state of the forests and forestry in different parts of Europe; identify various production goals that can be found in European forestry, contrast them with objectives regarding, for example, environmental conservation, and discuss ways to handle possible conflicts, and discuss how trends in society and environment (climate) affect European forests and forestry, the ecosystems, the carbon accounting, the use of forests, as well as the forest industries and their markets.
**Content**
Forestry in different parts of Europe, the various objectives within forestry, as well as the trends affecting forest ecosystems, forestry, forest production, forest conservation and forest industry, special topics within forest management and forest policy.
**Modes of study**
Lectures (approx. 70 h), project and group works (approx. 10 h), panel discussions (approx. 10 h), excursions (approx. 10 h), examination (approx. 2 h) and self-studies (approx. 20 h).
**Study materials**
To be specified later.

**Evaluation criteria**

0-5. Evaluation is based on written examination (50%) and general activity (project and group works, panel discussions and other assignments) (50%).

**Teachers**

Teachers from different MSc EF Consortium universities. Contact person in Joensuu: Professor of Forest Information Systems Timo Tokola.

## 3513061 Academic skills in forest sciences (1.5 ECTS)

**Learning outcomes**

Upon successful completion of this course the students will be able to effectively communicate scientific knowledge when interacting with different audiences and using a variety of communication tools including traditional and ICT-based tools (e.g., blogs) and have solid grounding for thesis and academic paper writing, as well as for presenting scientific findings orally.

**Content**

Academic skills and competencies related to oral presentations (using Power Point, Prezi, posters, etc.) and other forms of communication (academic writing, using ICT-based tools), as well as for MSc thesis writing.

**Modes of study**

Lectures and interactive sessions on communication and presentation techniques (20 h); Practicals - individual oral presentation, and group work on other communication methods (wiki, blog, or others). The themes of the practicals' contents will be selected from recent literature on European forestry, forest ecology, forest economy, forest policy or other relevant forestry fields (20 h).

**Evaluation criteria**

0-5 Assignments 100%.

**Teachers**

Senior researcher Blas Mola and adjunct instructors.

## 3513148 Research methodology in forest sciences (3.5 ECTS)

**Learning outcomes**

Upon successful completion of this course students are expected to be able to understand the principles of research methodology in forestry, taking into account the research issue and objective formulation as well as choosing an appropriate research approach, experimental set-up and sampling technique. Students will be able to understand basic biometric and ecosystem modeling concepts and to apply basic commands of R statistics to model and analyse the collected data. In addition, students will be able to critically evaluate accuracy, error types and reproducibility of research results. Finally, students will understand basic concepts in Geographic Information Systems and remote sensing techniques, and the use the basic GIS software to solve spatial problems and perceive the potentials for forestry related research.

**Content**

Applied statistics, research methodology, biometric and ecosystem modeling concepts, R statistics, GIS and remote sensing techniques.

**Modes of study**

Lectures on research, data analysis, statistical concepts and methods (28 h),

practical exercises with R statistics and GIS software (14 h). Modeling group work and learning diary.

**Study materials**

Wonnacott, R. & Wonnacott, T. 1985. Introductory Statistics, 4th edition, John Wiley and sons

Hamilton, L.C. 1992. Regression with Graphics, A second course in applied statistics. Duxbury Press

**Evaluation criteria**

0-5 Assignments (30%) and final examination (70%).

**Teachers**

Senior Researcher Blas Mola and adjunct instructors.


## 3513154 Global virtual seminar (2 ECTS)

**Learning outcomes**

Upon successful completion of this course the students should be able to have a global view about the sustainable development goals (SDGs) with a special focus on the chosen topic. Students will familiarize themselves with the chose topic by interviewing experts and by critically examining recent scientific literature on the chosen topic. The topics will vary between the years, and will focus on, e.g., different elements of the SDGs in different countries. The final virtual seminar will provide students an in-depth view on differences and similarities between countries on the chosen topic.

**Content**

The course consists of three elements: (1) The introductory lectures will introduce the study methods and the available topics. (2) Each group will prepare a proposal how to investigate the topic. All students prepare an individual presentation (10 min) based on the findings from interviews and literature. (3) Each group will firstly present the preliminary findings to all other students and supervisors internally and secondly prepare a final presentation (20 min) about the chosen topic for the final virtual seminars that ends the course.

**Modes of study**

Introductory lectures (approx. 4 h), interviews and group work (approx. 20 h), seminar (approx. 2 h) and self-studies (approx. 20 h).

**Study materials**

Available in Moodle

**Evaluation criteria**

0-5 The grading will be as follows: 40% (individual presentation) and 60% (group presentation). Contents: sound concept for investigating topic (20%), critical evaluation of the national achievements regarding the SDGs (20%), comprehensive comparison between the countries (20%); Presentation: style and layout of the presentation (20%), use of ICT and skills in presenting (20%).

**Teachers**

Teachers from different MSc EF Consortium universities. Contact person in Joensuu: Professor of Forest Information Systems Timo Tokola.

# Elective courses

A minimum of 30 ECTS credits of elective courses must be completed during the first academic year. In the below tables, the elective courses are listed according to the study tracks which are as follows:

*Track 1: Decision support systems for resource management*
*Track 2: Resource management for ecosystem services*
*Track 3: Spatial and ecological modelling*
*Track 4: Resource economics and policy*
*Track 5: Silviculture and forest engineering*
*Track+: Global perspective*

## The main learning outcomes of the different study tracks

| Study tracks | After completing the core courses of the study track in question, students: |
|---|---|
| **Track 1:** Decision support systems for resource management | 1 a. know how to establish and to use forest resource information services;<br>1 b. have advanced knowledge about different forest governance and decision support systems;<br>1 c. are able to compare various utilities used in forest resource management;<br>1 d. have advanced knowledge of forest planning practices and operations used for resource management. |
| **Track 2:** Resource management for ecosystem services | 2 a. have advanced knowledge of current theories and practices used in resource management;<br>2 b. are able to understand how to manage different resources for ecosystem services;<br>2 c. are able to model ecological and social processes used for ecosystem services;<br>2 d. have advanced knowledge on carbon dynamics and possibilities for management of carbon cycle in forest ecosystems. |
| **Track 3:** Spatial and ecological modelling | 3 a. understand the theory behind the analyses related to spatial and ecological modelling;<br>3 b. have obtained the ability to routinely use complex spatial analyses and ecological models e.g. for natural hazard and risk management;<br>3 c. understand different aspects related to spatial data management used in forestry;<br>3 d. have advanced knowledge of major concepts and approaches for spatial and ecological modelling;<br>3 e. know a variety of applications used in spatial and ecological modelling. |
| **Track 4:** Resource economics and policy | 4 a. are able to understand advanced economics of multiple-use forestry;<br>4 b. have the ability to use monetary and multi-criteria methods for evaluating forest management options;<br>4 c. have gained advanced knowledge of applied forest bioeconomy and new biomaterials;<br>4 d. have a good overview of the forest governance and environmental policy aspects in Europe. |
| **Track 5:** Silviculture and forest engineering | 5 a. have become familiar with biological processes in forest ecosystems;<br>5 b. have advanced knowledge of silviculture and forest management practices in different parts of Europe;<br>5 c. are able to understand how the management and use of forests affect different ecosystem services;<br>5 d. are able to analyse different forest ecosystem management concepts. |
| **Track +:** Global perspective (a standard track 1, 2, 3 or 4 in Europe + additional studies with global Associated Partner HEIs in Canada, China, or Brazil) | 6 a. have advanced knowledge of differences in global forest ecosystems;<br><br>6 b. have become familiar with various forestry practices and operations used in different climatic zones outside Europe;<br><br>6 c. are able to identify various production goals that can be found in global forestry;<br><br>6 d. have gained knowledge of current trends in global forest governance and environmental policy. |

The importance/relevance of the course for different study tracks is marked as

x important/relevant

xx very important/relevant (helps to prepare for studying more advanced courses of the study tracks of the second academic year).

Descriptions of the elective courses below can be found in WebOodi: https://weboodi.uef.fi/weboodi/

## Elective core courses for different study tracks 2019-2020

| Code | Name of Course | Timing | ECTS | Track 1 | Track 2 | Track 3 | Track 4 | Track 5 |
|------|----------------|--------|------|---------|---------|---------|---------|---------|
| 3513144 | Analysis of forest economics and policy | Autumn | 6 | xx | | | xx | |
| 3513142 | Basics of wood material science | Autumn | 4 | | | x | | x |
| 3513175A | Carbon dynamics of forest soils (field course) | Autumn | 3 | | x | x | | xx |
| 3513175B | Carbon dynamics of forest soils (literature exam) | Autumn | 4 | | x | x | | xx |
| 3513127 | Current issues in forest conservation and biodiversity | Autumn | 3 | | x | | | xx |
| 3513040 | Economics of multiple-use forestry | Autumn | 3 | xx | xx | | xx | |
| 3513057 | Fibrous products | Autumn | 5 | | | x | | x |
| 3513165 | Foresight methods and applications for the forest sector | Autumn | 5 | xx | x | x | xx | x |
| 3513170 | Forest ecosystem modelling, concepts and applications | Autumn | 2-5 | x | xx | xx | x | x |
| 3513174 | Forest health management | All year | 3 | | | | | ** |
| 3513044 | Forestry in Russia | Autumn | 5 | x | x | x | x | x |
| 8020270 | Information skills and sources in science and forestry for international students | Autumn | 1 | x | x | x | x | x |
| 3513149 | Intensive forest management and production of forest biomass | Autumn | 3 | | | | | xx |
| 3513129 | Supply and energy use of lignocellulosic biomass | Autumn | 6 | x | x | | | x |
| 3513168 | Timber transportation | All year | 3 | x | | | | xx |
| 8031003 | University study skills | Autumn | 1 | x | x | x | x | x |
| 3513028 | Advanced geographical information systems | Spring | 5 | xx | xx | xx | | |
| 3513029 | Advanced remote sensing | Spring | 5 | xx | xx | xx | | |
| 3513019 | Bioenergy markets and policies | Spring | 6 | x | | | xx | |
| 3510011 | Data-driven qualitative methodologies for forest scientists and foresters | Spring | 5 | | | | | |
| 3513011 | Forest zoology | Spring | 4-6 | | | | | xx |
| 3514017 | Industrial forest biotechnology and biorefining | Spring | 6 | | x | | | |
| 3513135 | Innovation management | Spring | 4 | x | x | x | x | x |
| 3513151 | International forest governance and environmental policy | Spring | 5 | x | x | | xx | |
| 3513123 | Nutrient dynamics in forest ecosystems | Spring | 4 | | | x | | xx |
| 3513147 | Perspectives to bioeconomy | Spring | 6 | x | x | x | x | x |
| 3513070 | Principles of scientific inquiry in forest ecology and biodiversity research | Spring | 3 | | x | | xx | |

| 3513159 | Structure and properties of wood-based materials | Spring | 5 | | | | | x |
|---|---|---|---|---|---|---|---|---|

**Online elective courses at different partner universities (currently available only at UoL, other courses might be available at the different partner universities at later stage and the information will be updated here accordingly)**

| | ECTS | Track 1 | Track 2 | Track 3 | Track 4 | Track 5 |
|---|---|---|---|---|---|---|
| *UoL* | | | | | | |
| Introduction to spatial statistics: Spatial analysis with R | 5 | | | x | | |
| Forest dynamics in a global change context: drivers, processes and modelling approaches | 5 | | | x | | |
| Stand to continental forest health management | 5 | | | x | | |

\* Track 1: Decision support systems for resource management, Track 2: Resource management for ecosystem services, Track 3: Spatial and ecological modelling, Track 4: Resource economics and policy and Track 5: Silviculture and Forest Engineering. The relevance of the courses for each study track (x=relevant, xx=very relevant).

## Other courses*

1131003 Orientation for international students (1 ECTS) (highly recommended)
8031006 University computing skills (2 ECTS)) (recommended for those with limited computing skills)
8015008 Elementary Finnish (2 ECTS) (highly recommended)
1130007 Career planning - international students seeking a job or a traineeship in Finland (2 ECTS)
8015013 Academic writing skills for Students in the International Master's degree Programmes of the School of Forest Sciences (3 ECTS)

*These courses are not counted as ECTS of elective courses, however.

# Module 2

### 3513073 European forestry field course (8 ECTS)
**Learning outcomes**
Upon successful completion of this course students are able to have deep understanding of contemporary forest management in different regions of Europe. In addition, they are able to comprehend the influence of historical, cultural and geographical factors in European forestry.
**Content**
An intensive field course where the students will familiarize themselves with topical forestry issues in European countries (Austria, France, Germany, Romania and Spain).
**Modes of study**
Intensive field course including forest and cultural visits, lectures, seminars and presentations. The students are required to carry out group works, discuss given topics and to prepare individual reports.
**Study materials**
Will be distributed during the course.
**Evaluation criteria**
0-5. Grading is based on the given assignments of the teachers in the MSc EF

Consortium universities.
Teachers
Teachers from different MSc EF Consortium universities. Contact person in Joensuu: Professor of Forest Information Systems Timo Tokola.
**Time**
May 2020

## 3513158 Applied period in forest institutions (10 ECTS)
**Learning outcomes**
Upon successful completion of this course students are able to know through working as a part of a team how the organisation is operating in European and in international levels; apply their skills and knowledge in practice; have knowledge and understanding of European and international business culture and values, team work practices as well as project management and how a research project starts and how it is managed, funded and reported.
**Content**
The course consists of a work assignment in a national or international forestry-related institution. The course is project oriented, and the topic of the work assignment is agreed upon in cooperation with the hosting organisation, the supervisor and the student. The course is supervised by a lecturer from one of the MSc European Forestry partner universities. An essential part of the course is a final report that the students write on the basis of the training period.
**Modes of study**
Participating in a project, final report on the findings during the course and a seminar presentation based on the report.
**Study materials**
Will be distributed during the course.
**Evaluation criteria**
0-5. Grading is based on the written report (40%), oral presentation (30%) and general performance during the internship based on supervisor's evaluation (30%).
**Teachers**
Supervisors from different MSc EF Consortium universities. Contact person in Joensuu: Professor of Forest Information Systems Timo Tokola.
**Time**
June-July 2020

### Applied period: students' experiences

"The Applied Period in the Forstamt Johanniskreuz has provided opportunities for independent silvicultural research, harvest operation planning and analysis, and the variety of tasks and responsibilities that day-to-day forestry entails. Throughout the Applied Period, work was carried out with the guidance and support of the highest caliber foresters and administrative leaders, whose insights, experience and willingness to mentor contributed substantially to the educational and professional value of the time spent here".

*-John Foppert, AP in Forstamt Johanniskreuz (Germany)-*

"The applied period in Brazil was organised as a partnership with Federal University of Paraná cooperating with two other Brazilian state universities: State University of São Paulo and Federal University of the Amazon. The challenging objective of this applied period was to organise and conduct excursions, cultural visits and practical work within three regions of the country, representing three of Brazil's major and most important biomes: the Atlantic forest *mata Atlântica* in the southern state of Paraná, the tropical rain forest - floresta tropical- in the region of Amazonia - Para state and finally in the Savanna region, Cerrado, in the country's central part – the states of São Paulo and Mato Grosso du Sul. The practical placement gave us the unique opportunity to see various, very diverse (environmentally and culturally) regions, do challenging work and nevertheless gave us a better understanding and a broader picture of Brazil's importance on an international level as an impressively diverse country and a land of opportunity in which there are still so many things to be done, discovered and understood".

*-Alexandru Giurca, AP in Federal University of Paraná, Brazil-*

"The Applied period I have done from February to April 2011, was in a private company located in Joensuu, Finland. The company, Arbonaut Oy Ltd., provides the customers with information systems and GIS solutions for forest resource assessment and forest planning. The company is composed of different teams, including: an IT team, the Powerline Team, the REDD Team and the Inventory Team. During the Applied Period, the work was concerned mainly about forest inventories, but it also included some tasks regarding the REDD Team. This applied period has been very useful to practically apply the theoretical knowledge acquired in the previous months during the studies at the University of Eastern Finland".

*-Stefano Puliti, AP in Arbonaut Oy Ltd (Finland)-*

Applied period guidelines can be found at:
www.uef.fi/en/web/mdp-europeanforestry/materials

## Module 3

For the second academic year of studies at the MSc EF, the coordinators of the consortium universities will distribute the students equally among the second-year study tracks available. The preferences of the students are taken into account as much as possible.

The offered study tracks for the second academic year are:
- *Full academic year at AgroParisTech (France)*
- *Full academic year at ALU (Germany)*
- *Full academic year at BOKU (Austria)*
- *Full academic year at UoL (Spain)*

- *Full academic year at UTBv (Romania)*

Each university offers an equal number of study places to the students. The individual study tracks are discussed and decided during the spring of the first academic year (approx. February-March).

The details on the second-year studies are agreed individually with the coordinator at the partner university to form an interesting and relevant study plan for the student, fitting the topic of the thesis and providing the required skills and competences. It is also possible to complete an MSc thesis and/or some advanced-level courses at Associated Partner Universities in Brazil, Canada or China if agreed upon by the second-year home university.

Selected elective core courses for different study tracks are listed below. Also other courses available at the second-year home university can be included in the study plan, if agreed upon by the local coordinator of the second-year home university. The descriptions of the courses below as well as of the other courses that can be selected can be found on the web pages of each Full Partner University.

## Selected elective core courses for different study tracks

| Code | Name of Course | ECTS | Track 1* | Track 2* | Track 3* | Track 4* | Track 5* |
|------|----------------|------|---------|---------|---------|---------|---------|
| AgroParisTech | Course descriptions available at http://www2.agroparistech.fr/Forests-and-their-environment-FEN.html | | | | | | |
| 9.14 | Models in forest management | 3 | xx | xx | xx | xx | xx |
| 9.15 | Understanding tree structure and functions | 3 | x | x | xx | x | xx |
| 9.16 | Advanced statistics (optional) | 3 | xx | xx | xx | xx | xx |
| 9.17 | Geographical information systems in forest ecology | 3 | xx | xx | xx | x | xx |
| 9.18 | Biogeochemical cycles in forest ecosystems | 3 | x | x | xx | x | xx |
| 9.19 A | Forest and forestry in the context of global ecosystem in France and Germany | 3 | xx | xx | x | xx | xx |
| 9.19 B | Dynamics of forest plant and tree communities | 6 | x | x | xx | x | xx |
| 9.20 | European forests: challenges and opportunities | 3 | xx | xx | x | xx | x |
| 9.21 | Introduction to the forestry context in Lorraine | 3 | xx | x | x | x | xx |
| 8.10 | Carbon accounting in forest ecosystems (optional) | 3 | xx | x | x | xx | xx |
| 9.01 | Project in forest sciences or engineering | 6 | xx | xx | xx | xx | xx |
| ALU | Course descriptions and timetables available at https://www.msc-forst.uni-freiburg.de/en/studying | | | | | | |
| 52160 | Assessing, analysing and monitoring of vegetation | 5 | x | x | xx | | x |
| 64055 | Biomass resource assessment | 5 | xx | xx | xx | x | x |
| 54200 | Carbon forestry | 5 | xx | xx | x | xx | x |
| 54190 | Close-to-nature forest management | 5 | xx | xx | x | xx | xx |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 52180 | Conservation of Forest Biodiversity | 5 | x | xx | x | x | x |
| 94265 | Ecosystem management | 5 | x | xx | x | x | x |
| 64101-10 TN | Environmental economics | 5 | x | x | | xx | x |
| 42255 | Forestry economics and management | 5 | xx | x | x | xx | x |
| 42245 | Forest inventory design | 5 | x | xx | xx | x | x |
| 64030-8 TN | Forest resources and management in France and Germany | 5 | x | x | x | x | x |
| 54110 | Forest resources and their goods and services | 5 | xx | xx | x | xx | xx |
| 54170 | Integrated land use management | 5 | xx | xx | | x | x |
| 54180 | International forest governance | 5 | x | x | | xx | x |
| 52145 | Insects Communities and Dynamics | | x | x | xx | x | xx |
| 95310-20 TN | Natural hazards and risk management | 5 | x | xx | xx | x | xx |
| 54130 | Plantation forestry | 5 | x | xx | | xx | xx |
| 42250 | Soil ecology & management | 5 | x | xx | x | x | xx |
| 64097 | Tropical biology and conservation | 5 | x | xx | | x | x |
| 64096-15 TN | Tropical forest ecology | 5 | x | xx | | x | x |
| 64088 | Wildlife behavioral ecology | 5 | x | xx | x | x | |
| **BOKU** | **Course descriptions and timetables available at** **https://online.boku.ac.at/BOKUonline/semesterplaene.semesterplan?csr_nr=174&csj_nr=1820&csum_flag=J&cbackto=T&corg=&csprache_nr=1&cstp_nr=3825** | | | | | | |
| 913324 | Adapting forest management to climate change | 2 | x | x | x | | x |
| 912328 | Agroforestry in mountain regions | 2 | | xx | | xx | x |
| 169302 169303 | Applied development research I, II | 3+3 | | x | x | x | |
| 912337 | Biodiversity and conservation of mountain forests | 2 | | x | x | | |
| 915320 | Cable yarding project | 1.5 | | | | x | x |
| 913302 | Decision support systems | 3 | xx | | x | | x |
| 916323 912332 915300 | Field camp I, II, III | 2+3+3 | x | xx | xx | x | x |
| 913327 | Fire management in mountain forest ecosystems | 2 | x | x | x | | x |
| 914309 | Forest inventory | 3 | xx | x | | | |
| 733303 | Forest resources economics | 4.5 | x | x | | xx | |
| 735333 | Forest products, marketing and strategy | 3 | | x | | xx | |
| 915301 | Harvesting systems for mountainous regions | 2 | | x | | x | xx |
| 732337 | Innovations for sustainable forest management | 4 | x | x | | xx | |
| 913339 | Modelling of mountain forest ecosystems | 2.5 | x | x | xx | | x |
| 732321 | Mountain forest policy | 4.5 | | x | | xx | |
| 913311 | Multiple criteria decision making in natural resource management | 3 | xx | x | | x | x |
| 913338 | Natural resource management in mountain forests I, III | 4 + 2 | x | xx | | x | x |
| 871314 | Protection and mitigation measures against natural hazards | 3 | | x | xx | | x |
| 857321 | Remote sensing and GIS in natural resource management VO / UE | 3 + 3 | xx | x | xx | | |

| Code | Course | Credits | | | | | |
|------|--------|---------|---|---|---|---|---|
| 915302 | Road network planning | 3 | x | x | | x | xx |
| 871373 | The role of forests in mountain risk engineering | 2 | | x | | x | xx |

**UoL**	**Course descriptions and timetables available at**
http://www.europeanforestry.udl.cat/en/index.html

| Code | Course | Credits | | | | | |
|------|--------|---------|---|---|---|---|---|
| 111001 | ST in mapping and monitoring forest natural resources | 3 | x | x | xx | xx | x |
| 111002 | ST in spatial statistics | 5 | x | x | xx | x | x |
| 111003 | ST in methods in hazard analysis and risk assessment | 3 | x | x | xx | x | x |
| 111004 | ST in global environmental change and invasive species | 3 | x | x | xx | x | |
| 111005 | ST in precision forestry | 3 | xx | x | xx | x | xx |
| 111006 | ST in multi-scale forest dynamics models | 5 | xx | xx | xx | x | x |
| 111007 | ST in the earth system in a time of change | 5 | x | x | xx | x | x |
| 111008 | ST in landscape ecology and biological connectivity | 5 | | x | xx | x | x |
| 111009 | ST in biodiversity and ecology | 5 | x | x | xx | x | x |
| 111010 | ST in disturbance ecology and forest health | 5 | xx | x | xx | x | xx |
| 111011 | ST in resource management and planning for ecosystem services | 5 | x | xx | x | x | x |
| 111012 | ST in decision support systems for resource management | 3 | xx | x | x | | xx |
| 111013 | ST in forest research & development | 3 | xx | xx | xx | xx | xx |
| 111014 | ST in bio-economy and principles of environmental sustainability | 3 | x | x | x | xx | x |
| 111015 | ST in markets and payments for ecosystem services | 3 | x | xx | | xx | x |
| 111016 | ST in European resource economics and policy | 3 | x | x | x | xx | x |
| 111017 | ST in data management and visualization with R | 5 | xx | x | xx | x | xx |
| 111018 | ST in molecular forest ecology: from genes to management | 3 | x | x | xx | x | |

**UTBv**	**Course descriptions and timetables available at**
https://www.unitbv.ro/en/prospective-students/academic-programmes/academic-programmes-in-foreign-languages.html

| Code | Course | Credits | | | | | |
|------|--------|---------|---|---|---|---|---|
| BPMF | Business process management in forestry (elective) | 6 | xx | x | | xx | xx |
| FBB | Forest based bio-economy (elective) | 5 | x | x | | xx | xx |
| FMC | Forest management and chain of custody certification | 6 | | x | | x | xx |
| SSFM | Decision-support systems in forest ecosystem management (elective) | 5 | xx | | | x | xx |
| EPWB | Energy procurement from woody biomass(elective) | 5 | x | | | x | xx |
| LCAF | Life cycle assessment in forestry (elective) | 6 | x | x | x | x | xx |
| MRP | Management of research projects (elective) | 5 | | | | | x |
| SYFE | Silviculture and yield of forest ecosystems | 4 | x | x | x | xx | xx |
| SMFP | Strategy and marketing of forest products | 4 | x | x | | xx | xx |

\* Track 1: Decision support systems for resource management, Track 2: Resource management for ecosystem services, Track 3: Spatial and ecological modelling, Track 4: Resource economics and policy and Track 5: Silviculture and forest engineering. The relevance of the courses for each study track (x=relevant, xx=very relevant).

## Courses at Associated Partner Universities

## Organisers
Federal University of Paraná, Brazil
Northwest A&F University, China
São Paulo University, Brazil
University of British Columbia, Canada
University of New Brunswick, Canada

## A preliminary list of available course topics
Federal University of Paraná, Brazil
To be updated.
Northwest A&F University, China
Forest resources and the means of vegetation restoration in China
The development and role of nature reserves in China
Forest products and utilisation of non-timber-oriented plants
Forest pest and disease control: problems and advancement
São Paulo University, Brazil
To be updated.
University of British Columbia, Canada
To be updated.
University of New Brunswick, Canada
To be updated.

For more information about the course contents and timetables, contact Marjoriitta Möttönen: marjoriitta.mottonen(at)uef.fi

## 3513620 M.Sc. thesis (Agr & For, European forestry) (30 ECTS)
**Organiser**
Second-year home university
**Time**
Generally in the spring semester of the second academic year (2020/2021):
Duration: ~6 months (estimated)
**Contact person**
The coordinators at the partner universities.
**Study mode**
Individual research in forestry. The general idea is to learn how to independently identify and carry out research in forestry. The goal is to produce such an internationally acceptable piece of research work with European or wider dimension included that can be published in an international scientific journal.
**Contents**
Detailed guidelines will be provided by the host university.
**Further information**
Information on titles and abstracts of MSc EF students is available on the webpage of the programme:

<http://www.uef.fi/en/web/mdp-europeanforestry/thesis>

**3513075 MSc European forestry thesis seminar (0 ECTS\*)**
**Organiser**
The University of Eastern Finland
**Time**
Arranged individually, after submission of the student's thesis (June – October 2021)
**Study mode**
A seminar consisting of the individual online presentation and discussion of each student's master's thesis in Moodle course site.
Further information: <http://www.uef.fi/en/web/mdp-europeanforestry/thesis-seminar>
\*Thesis seminar, although does not have credit load, is obligatory in order to graduate.

**European Forestry Forum – Job Fairs and Graduation Ceremony**
You have the opportunity to participate at the European Forestry Forum where the graduation ceremony takes place. All the graduated participants present their thesis to a wide audience of fellow students, researchers and employers. Those graduates who have not yet managed to find employment have an ample opportunity to meet potential employers and network with researchers from all over the world.

# COUNCELLING

MSc European Forestry Secretariat will offer confidential informal and formal conflict resolution services to resolve students' possible problems and concerns related to MSc European Forestry studies. If the problems and concerns are related to the studies of the second academic year, students can also contact the local coordinator of the MSc EF Full Partner university in question.

The possible conflicts and problems that cannot be managed by the local coordinator or by MSc European Forestry Secretariat are dealt with at the MSc EF Consortium level and/or at the MSc EF Full Partner university in question according to the rules of the university in question.
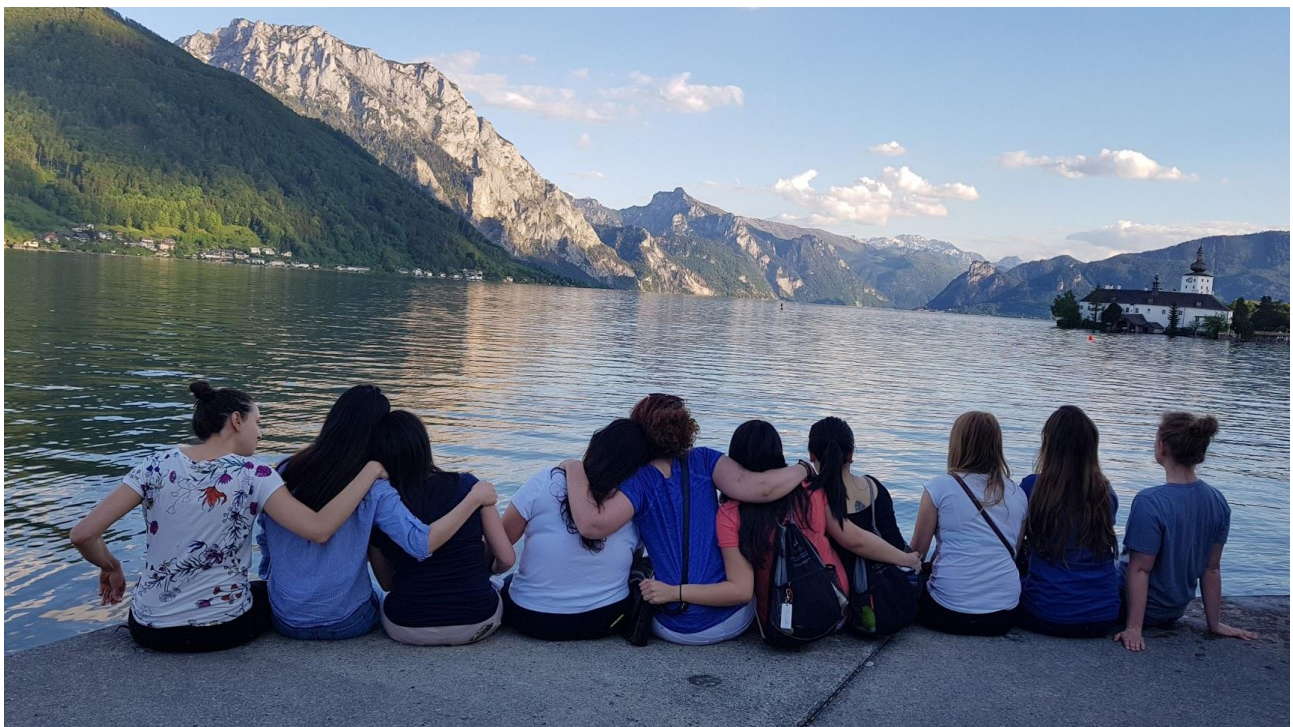
# ALUMNI

Our students graduate with an amazing network of alumni. During the studies, our students become acquainted with a number of academic experts throughout Europe. Additionally, each course itself is composed of various nationals hence facilitating the students to adapt to working in a multicultural environment.

European Forestry secretariat and the Erasmus Mundus programme aim to promote the professional and personal networking of its alumni. Students and graduates of the programme may join us in the MSc European Forestry Alumni group on Linked-In and also become a member of the Erasmus Mundus Students and Alumni Association (EMA). Students, alumni and staff are also active in MSc European Forestry Facebook group: www.facebook.com/europeanforestry/

**Master's degree programme in European Forestry Erasmus Mundus is organised by:**



**in cooperation with**



**and a number of Associated Industrial and Scientific Partners**