



# Erasmus Mundus Master in Evolutionary Biology

## Study Guide

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# 1 INTRODUCTION

Evolutionary biology seeks to understand the functioning of the living world (from bacteria to humans) by viewing organisms and their interactions as the result of a historical process that is driven by natural and sexual selection, the interplay of genetics, epigenetics and development, the interactions of organisms with their biotic and abiotic environment, biogeography, and macro-evolutionary processes like speciation. Modern evolutionary biology is not primarily focused on understanding the history of life and the course of evolution in the past, but mainly addresses evolution as it is happening now. Only few scientific theories have been as influential as Darwin's theory of evolution. As it became obvious that many biological processes are better understood in their evolutionary context, evolutionary thinking became an integral part of disciplines such as ecology, developmental biology, biogeography, phylogenetics and, more recently, epidemiology, immunology, genomics, bioinformatics, and systems biology. In addition, evolutionary thinking is gaining a strong foothold in non-biological disciplines such as economics, informatics, robotics, medicine, sociology, anthropology, linguistics, psychology and even philosophy. For example, evolutionary principles help us to understand why we get ill and how to protect against diseases ("Darwinian Medicine"); they help us to understand the human mind ("Evolutionary Psychology"), and they provide an explanation for the functioning of organisations and markets ("Evolutionary Economics").

The Erasmus Mundus Master Programme in Evolutionary Biology ([MEME](#)) is a two-year research oriented master programme for talented and motivated students who are interested in understanding evolution in all its facets. This multidisciplinary programme addresses the driving forces of evolution at all levels of organismal organisation (from cells and individuals to populations and ecosystems), and it allows students to study all kinds of organisms in a diversity of habitats. The focus is on how understanding the principles underlying evolution can provide new insights and help humankind to cope with present-day challenges in a variety of fields, including ecology, epidemiology, physiology, immunology, genetics/genomics, bioinformatics, economics and the social sciences.

To realize this ambitious goal, four European universities ([University of Groningen](#), The Netherlands; [Ludwig Maximilians University of Munich](#), Germany; [Uppsala University](#), Sweden; [University of Montpellier](#), France) have joined forces with [Harvard University](#) (USA) and [University of Lausanne](#) (Switzerland) as associate partners. At present, no university in the world can offer the complete range of sub-disciplines of the highly multidisciplinary research area of modern evolutionary biology. For a student studying at one university it is very difficult to get an overview of the field as a whole and to find a niche that perfectly fits the student's talents and interests. Even the MEME programme, offered by four universities with complementary research expertise and tradition, together with the associated partners, cannot cover the full breadth of evolutionary biology, but it is a significant step in this direction.

MEME offers students the opportunity to compose an individual study programme in evolutionary biology by combining elements from the complementary programmes that are already established at the participating universities. Students spend at least one semester (typically two semesters) at two different partner universities, and they will be awarded double degrees for this. In the first year, the emphasis is on scientific, methodological and

academic skills courses (taught in English), while the second year mainly consists of individually supervised research training. MEME students have a personal mentor, they are offered challenging multidisciplinary courses at the frontline of scientific research, they closely interact with leading researchers and can make use of modern, state-of-the-art techniques and facilities, and they are embedded in a high-quality international network. Accordingly, MEME will provide its students with an optimal preparation for a subsequent PhD study or for other career options in the variety of fields where evolutionary thinking is an asset.

The Board of MEME welcomes you to this challenging Master's programme. We hope to fulfil your expectations by providing hands-on experience with cutting edge research in one of the most interesting and important subjects in scientific research.



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## 2 MISSION AND OBJECTIVES OF THE PROGRAMME

The mission of MEME is to offer an advanced state-of-the-art training programme in evolutionary biology of all its facets, thus providing the students with the necessary knowledge and skills to be competitive on the scientific job market and to be open-minded and internationally experienced ambassadors of intercultural scientific exchange.

Objectives for students:

- to become familiar with the concepts and research methods of modern evolutionary biology;
- to become familiar with the diversity of ways “evolutionary thinking” can be applied in the various sub-disciplines of biology and in other disciplines;
- to gain research experience, including the identification of promising research questions, the formulation of research hypotheses, the design of experiments, the acquisition and analysis of data, and the presentation and publication of results;
- to be optimally prepared for joining a PhD programme;
- to become a critically thinking and independent scientist;
- to become familiar with the norms, standards and ethics of scientific research;
- to become part of an international scientific network;
- to acquire skills in communication, writing and analytical thinking to be prepared for a job inside or outside of academia;
- to know their own strengths and be ready to make informed career decisions;
- to learn about and experience different cultures;
- to learn and use at least two languages.

Objectives for the institutes:

- to enhance the collaboration among partner universities;
- to become a recognized centre of excellence for evolutionary research in Europe;
- to enhance mobility of staff and students;
- to offer an excellent teaching programme;
- to inspire the best students to choose a career in the field of evolution;
- to attract the best students to come to Europe;
- to provide an optimal training for the institutes’ future PhD students.

Contribution to the European objectives:

- to provide conditions for intercultural understanding;
- to enhance the career perspective for students from Europe and Third Countries;
- to create a centre of excellence and a dense research network in Europe.

### **3 SUMMARY OF THE MEME PROGRAMME**

The MEME programme is a double degree programme. MEME students have to obtain a MSc degree from two of the four partner universities of the consortium. This means that they spend at least one semester (in most cases two semesters) at two different partner universities. After successfully completing the programme, students will receive MSc diplomas from two partner universities.

The programme begins with the annual MEME summer school (see Section 5.6.1), where the first-year students meet fellow students of their own cohort and many students from previous cohorts. During these summer schools the whole “MEME family” (students and professors) meet in an informal atmosphere. A scientific programme is combined with information sessions, evaluation meetings, an excursion, the annual graduation ceremony, and a graduation party.

After the summer school, the students start their first semester with a course programme in Groningen or Uppsala. During this semester, they follow a package of advanced “core courses” (see Section 5.1) that provide an overview of the fundamental principles underlying modern evolutionary biology. After the first semester, most students participate in a winter school (see Section 5.6.2), which is sometimes partly organized by the first-year students themselves.

For their second semester, students move to either Montpellier or Munich, where they continue doing coursework (see Section 5.2), but also carry out a small, independent research project. At the end of this semester, most students attend the annual MEME summer school for a second time. The third and fourth semesters focus mainly on research projects (see Section 5.5). For these projects, students typically go to the two partner universities from which they want to obtain a degree. A combined number of twelve students of each MEME cohort get the opportunity to conduct a research project at Harvard University (with a maximum of eight) and Lausanne (with a maximum of six), which are associate partners of the MEME consortium (see Section 5.5.5).

After having completed two years of study, students are awarded a MEME graduation certificate during their third summer school. During their two years of intensive academic activity students have the support of a personal mentor (see Section 6.4) who assists them in putting together a study plan that fits optimally to the students’ interests, needs and career aspirations. The mentor also ensures that students satisfy some minimal degree requirements.

## 4 DEGREE REQUIREMENTS

MEME students have to satisfy two types of requirements: (1) overarching requirements (specified in section 3.1 below), designed according to EU rules, in relation to the fact that MEME is Erasmus+ certified double degree programme; and (2) the local requirements imposed by the two universities from which they want to receive the degree.

### 4.1 General programme requirements

The MEME programme consists of four semesters, corresponding to a total of 120 EC according to the European Credit Transfer and Accumulation System ([ECTS](#), see Section 6.1). One EC corresponds roughly to 28 hours of study, and 60 EC correspond to the study load of one academic year (42 weeks of study).

MEME offers students the opportunity to switch each semester to the university of their choice and, thus, to follow a trajectory that best suits their interests. However, each individual trajectory has to satisfy some minimal requirements; MEME students need to:

- participate in at least two MEME summer schools;
- follow in their first semester a 30 EC programme of “MEME core courses” (either in Groningen or in Uppsala);
- spend at least 15 EC on additional course work at one or more universities that are different from the university where the first semester was spent;
- spend at least 60 EC on research work (lab based, field based, or theoretical); at least 30 EC of this research work should be dedicated to a “master thesis project” at one of the partner universities in the 3<sup>rd</sup> semester.

These minimal requirements add up to  $30 + 15 + 60 = 105$  EC. The remaining 15 EC of “electives” can be devoted to more coursework, more research, or to a variety of other science-related activities that contribute to the “scientific maturation” of the student and/or enhance the student’s perspectives on the labour market (see Section 5.4). In principle, it is possible to spend more than 15 EC on electives, since it is possible to obtain more than 120 EC in the two years.

There are two important requirements on student mobility:

- no more than 90 EC can be awarded from the same university;
- to acquire a double degree, students need to satisfy the local degree requirements of at least two of the four European partner universities.

Students are enrolled in the following degree programs according to the options they choose:

- University of Groningen: Evolution & Ecology: Evolutionary Biology (Master)
- University of Montpellier: Biodiversité, Ecologie et Evolution (Master)
- LMU Munich: Evolution, Ecology and Systematics (Master)
- Uppsala University: Biology (Master) (for cohorts up to and including 2020)
- Uppsala University: Evolutionary Biology – MEME (Master) (for cohorts starting 2021)



## **4.2 Local degree requirements**

### **4.2.1 Groningen**

To obtain a degree from the University of Groningen (UG) students must have been registered at the UG for at least two semesters and must have obtained at least 60 ECTS credits from the UG. These credits must include 5 ECTS credits for a colloquium (a public lecture with subsequent discussion on a topic of general relevance). All UG research projects are thesis projects that are subject to the regulations of the Master's programme 'Ecology and Evolution' at the UG (see Section 5.5.1). In principle, a 30 ECTS research project in the fourth semester can be executed at Harvard, Lausanne or another external institute, as long as the student is registered in Groningen. This, however, requires that the project is set up according to the UG regulations for a thesis project, that the project is (co-) supervised by a GELIFES professor, and that the thesis is defended at the UG.

### **4.2.2 Munich**

To obtain a degree from the Ludwig Maximilians University Munich (LMU) students must have been registered at the LMU for at least two semesters, including the semester in which they graduate. During that time they must obtain 60 EC from LMU. As in Groningen, these credits can include a 30 EC research project conducted at Harvard, Lausanne or elsewhere, provided that the LMU regulations (see Section 5.5.3) for such a project are met and the project is (co-)supervised by a faculty member of LMU.

### **4.2.3 Montpellier**

To obtain a degree from the University of Montpellier (UM), students must be registered for at least one semester. During the registration period, students must obtain at least 30 ECTS credits from UM. Although it is possible to obtain a degree from UM after spending only the second semester in Montpellier, it is advisable to also spend an additional semester for a research project. As in Groningen and Munich, the research semester can also be spent at Harvard (or elsewhere) provided the UM regulations (see Section 5.5.2) are met and the project is co-supervised from Montpellier. To be able to obtain a diploma from Montpellier, the last grade of the programme should be registered before the end of the calendar year of year two.

### **4.2.4 Uppsala**

To obtain a degree from Uppsala University (UU) students must have been registered at UU for at least one semester and must have passed all relevant MEME courses specified in section 2. Although it is possible to obtain a degree from UU after spending only the first semester in Uppsala, it is advisable that students who want to obtain a degree from UU spend an additional semester for a thesis (in semester three) or research project (semester four) in Uppsala.

### **4.2.5 Harvard**

Harvard University is an associate partner of the MEME programme and a maximum of 8 students per cohort have the opportunity to spend a research semester at Harvard. In order to secure one of these positions, MEME students have to submit an application to the MEME coordinator during their 2<sup>nd</sup> semester. The application deadline is June 1, and it applies to

the 4<sup>th</sup> semester projects. Students who have been selected to conduct a research project at Harvard, must first find a suitable research group (a “lab” in the jargon of American universities). To this end, a student has to take the initiative and contact one or several research group leaders in order to enquire about the possibilities of doing a 30 ECTS project under their supervision. The Harvard supervisor needs to be a faculty member of the Department of Organismic and Evolutionary Biology (OEB; see list of faculty members [here](#)). Since not all Harvard professors are fully aware of the MEME exchange programme, it is useful to send them some information about MEME, stressing the fact that MEME is a highly competitive international programme directed at the top 5-10% students in evolutionary biology of a given cohort. It is also advisable to provide them with some personal background information, a list of research interests related to the lab in question, and some indication of motivation and performance. Applicants should keep in mind that Harvard professors can afford to be choosy, and that they will only accept Master’s students from whom they can expect to profit in their own research.

The project at Harvard must be co-supervised (from a distance) by one of the faculty members of the university where the student is registered. The co-supervisor has to ensure that the project satisfies all the local requirements of this university. Although these students are physically present and conducting research at Harvard, their project is formally recognized as a thesis project at one of the European partner universities. For this reason, the students must always be registered at one of these universities. It is of crucial importance that the (external) MEME supervisor is fully informed about the procedure and the fact that he/she has quite some responsibility for this project. Ideally, the MEME supervisor works in a field related to the Harvard project, making it easier to keep in touch and judge the progress of the project. Once an (“internal”) Harvard supervisor and an (“external”) MEME supervisor have been identified, the student should write a short research proposal (not more than one page!) stating the research questions to be addressed and (in broad outline) the methods to be used for tackling these questions. In addition to this proposal, the application should include an informative CV, an invitation letter from the Harvard supervisor, and a consent letter of the external MEME supervisor. The application should be sent to the MEME Office in Groningen (Femke Schouten, [f.a.schouten@rug.nl](mailto:f.a.schouten@rug.nl)). From there, all complete applications will be sent to Harvard. The Department of Organismal and Evolutionary Biology ([OEB](#)) is in charge of processing the applications. The OEB will make the selection and communicate the results to the students. Once students have been informed of the outcome Harvard will start the administrative procedure regarding registration and visa (see Section 7.1).

Notice that two MEME students executing similar research projects at Harvard but registered at different partner universities may be subject to slightly different regulations reflecting differences in the degree requirements of their European “home” universities. For example, the master thesis resulting from a project executed in Harvard needs to be defended (potentially via Skype) if the student is registered in Groningen and Montpellier, while a formal defence is not required from the University of Uppsala.

#### **4.2.6 External projects**

Under exceptional circumstances, research projects can also be conducted outside the MEME consortium. Students who want to do an “external” research project need the approval of their mentor and the board of the MEME. Formally, the requirements are similar to the research projects executed at Harvard University. During the project period, they must be

registered at one of the MEME universities, and in addition to their local supervision they must have a co-supervisor from this university.

## 5 STRUCTURE AND CONTENT OF THE PROGRAMME

In this section a typical “MEME trajectory” and what is to be expected at the MEME partner universities is described in detail. Section 5.1 outlines the mandatory core courses to be followed in either Groningen or Uppsala. Students are more flexible from their second semester onwards, they go to either Montpellier or Munich for a combination of (elective) coursework and individually arranged research projects. Section 5.2 briefly describes some of the courses that are available there. Additional course and electives, are listed in Sections 5.3 and 5.4. Most MEME students devote their 3<sup>rd</sup> and 4<sup>th</sup> semester to two major research projects. The requirements for such projects are described in Section 5.5. Section 5.6 is devoted to the MEME summer and winter schools.

	Semester 1	Semester 2	Semester 3	Semester 4
Groningen	MEME core courses (30 ECTS)		Thesis (30 ECTS)	Thesis 2 (30 ECTS)
Uppsala				Research Project (30 ECTS)
Munich	MEME specialization courses (15 ECTS) Research training project (15 ECTS)	Thesis 2 (30 ECTS)		
Montpellier				

### 5.1 The first semester

MEME students start their study programme by attending the annual MEME summer school that typically takes place in the third week of August (see Section 5.6.1). Subsequently they travel on to either Groningen or Uppsala where they spend their first semester. At both locations they follow a programme of about 30 ECTS of mandatory “core courses.” These courses have a double purpose: to provide students with a diversity of backgrounds with an overview of methods and concepts in modern evolutionary biology; and to provide students with basic skills required for conducting scientific research.

	<b>Semester 1 – Groningen or Uppsala</b>
Groningen	Behavioural Ecology & Evolution (9 ECTS) Evolutionary Theory (8 ECTS) Principles of Conservation Genetics in Natural Populations (5 ECTS) Genomics in Ecology and Evolution (5 ECTS) Research Proposal Ecology & Evolution (5 ECTS)
Uppsala	Evolutionary Patterns (15 ECTS) Evolutionary Processes (15 ECTS)

### 5.1.1 First semester in Groningen

The first semester in Groningen begins on the first Monday of September. The programme consists of five courses. These core courses are intense; every week students have 30-40 contact hours with their lecturers and supervisors. Here we give a very brief description of these courses; consult the [MEME website](#) for additional details.

#### [Behaviour, Ecology and Evolution](#) (9 EC)

A crash course teaching the basic skills for conducting independent behaviour- and eco-evolutionary research: formulating a relevant and timely hypothesis; finding literature on background and context; collecting data; analysing the data with the help of statistical software; presenting the results; writing a scientific article.

#### [Evolutionary Theory](#) (8 EC)

The course aims to provide an overview of modern evolutionary theory, with special emphasis on natural and sexual selection. In lectures and practical exercises students will be exposed to various modelling approaches (population genetics, quantitative genetics, adaptive dynamics, evolutionary game theory, life history theory), thereby experiencing the scope and limitations of these approaches.

#### [Genomics in Ecology and Evolution](#) (5 EC)

The objective of this course is to introduce students to the role of genomics, as it applies to fundamental questions in ecology and evolution. Topics include genome evolution, functional diversity, adaptation, speciation, genotype-phenotype interactions and conservation.

#### [Principles of Population Genomics in Natural Populations](#) (5 EC)

More info to follow

#### [Research Proposal Ecology & Evolution](#) (5 EC)

More info to follow

### 5.1.2 First semester in Uppsala

There are two core courses in Uppsala, each worth 15 EC. Check the [MEME website](#) for detailed information on the course content.

#### [Evolutionary Patterns](#) (15 EC)

The course focuses on how the evolutionary history is manifested in patterns that can be observed in and among organisms, and how these patterns can be detected and analysed to let us draw conclusions about the causes and the underlying processes. The course comprises lectures, seminars, laboratory sessions, and project work.

#### [Evolutionary Processes](#) (15 EC)

The course focuses on the major processes leading to evolutionary change: mutation, genetic drift, selection and migration. Each of these processes will be studied in detail, with emphasis on evolutionary changes in natural populations and how such changes can affect speciation. The course will also present state-of-the-art ecological and genetic tools for studying and understanding evolutionary dynamics in natural systems.

## 5.2 The second semester

Semester 2 – Munich or Montpellier	
Munich	Basic Evolutionary Genomics (3 ECTS) Advanced Evolutionary Genomics (3 ECTS) Evolutionary Ecology Modelling (3 ECTS) Experimental Behavioural Ecology (3 ECTS) Principles of Behavioural Ecology (3 ECTS) Multivariate Statistics (3 ECTS) Population Genetics (6 ECTS) Research training project (max 15 ECTS)
Montpellier	Advanced Population Genetics (2.5 ECTS) Advanced Statistics (2.5 ECTS) Genetic Data Analysis (2.5 ECTS) Hot Topics in Ecology and Evolution (2 ECTS) Modelling in Ecology and Evolution (2.5 ECTS) Reading papers and seminars (2 ECTS) Evolutionary Applications (1 ECTS) Research training project (15 ECTS)

In semesters 2 to 4, MEME students still have to spend at least 15 EC on additional course work and they have to spend at least 60 EC on research. In principle, the second semester can be completely devoted to research, and the remaining course work can be postponed to later semesters. For example, students can stay in Groningen or Uppsala for their second semester in order to conduct a 30 EC research project there. The standard option, however, is that MEME students move to either Munich or Montpellier for their second semester, where they combine 15 EC coursework with 15 EC work on a smaller research project. The third and fourth semester are typically entirely devoted to research.

### 5.2.1 Second semester in Montpellier

The second semester in Montpellier begins in the second week of February. MEME students are expected to first follow eight courses (totalling 15 EC) that are taught in English and have been especially designed for the MEME programme. They can also follow other (French-taught) courses. Here we briefly outline the eight MEME courses (check the [MEME website](#) for details).

#### [Advanced Population Genetics](#) (2.5 EC)

The course provides the theoretical background for understanding the principles of how the interplay of selection, mutation and genetic drift affects the evolution of populations.

#### [Advanced Statistics](#) (2.5 EC)

The course provides a solid theoretical background underlying modern statistics, insights into protocol and model building, and methods for the accurate interpretation of data.

#### [Genetic Data Analysis](#) (2.5 EC)

The course recalls essential concepts of population genetics theory; contrasts classical inference methods (e.g. F-statistics) with more modern approaches (e.g. coalescent theory); and shows how demographic history may be inferred from genetic patterns.

### [Hot Topics in Ecology](#) (EC 2)

A small group of students explores a selection of recent papers on a “hot” topic in ecology and evolution. The group then presents the topic to the rest of the class and leads the discussion.

### [Modelling in Ecology and Evolution](#) (2.5 EC)

This course familiarizes students with different kinds of models and approaches using R by working through problems in ecology and evolutionary biology.

### [Reading papers and seminars](#) (2 EC)

In this course, we will simulate several important steps in the dissemination of scientific results. At the beginning of the course, each student will be given one article, for which this student will write a summary, present a poster and give a short oral presentation. The challenge is to get to know the paper as if it were the student’s own. This involves reading of relevant literature, but most importantly understanding (or questioning!) each and every detail of the article.

### [Evolutionary applications](#) (1 EC)

The course discusses cases where evolutionary biology based implementations provide invaluable insight in applied issues such as vector control, conservation biology or fish stock management.

### [Grant proposal training](#) (2.5 EC)

This one week course will be offered at least in winter 2020 (and in following years if independent funding can be secured). It will be organised as a retreat during which students will write in small groups grant proposals on Evolutionary Biology topics.

## **5.2.2 Second semester in Munich**

The second semester in Munich begins around mid-April. While at the LMU, MEME students are able to participate in the courses offered in the Master’s programme Evolution, Ecology and Systematics ([EES](#)). All courses are taught in English. In particular, the following courses can be followed in the second semester:

### [Basic and Advanced Evolutionary Genomics](#) (3 EC each)

These two courses provide an introduction to the field of genomics. Topics covered include comparative genomics, evolution of genome size, gene and genome duplication, origin of new genes, isochores and GC content, codon bias, evolution of sex-biased genes and evolutionary functional genomics.

### [Evolutionary Ecology Modelling](#) (3 EC)

The course provides an introduction to mathematical modelling in (evolutionary) ecology. Students learn to understand models they encounter in the literature and to develop their own models in order to investigate biological questions.

### [Experimental Behavioural Ecology](#) (3 EC)

This course teaches students how to conduct empirical research in behavioural ecology, by collecting field data and conducting laboratory experiments.

### [Population Genetics](#) (6 EC)

This course provides an introduction into topics such as genetic drift, natural selection, migration and genetic mechanisms such as mutation and recombination.

#### [Principles of Behavioural Ecology](#) (3 EC)

This course addresses both the function of behaviour and the underlying mechanisms.

#### [Statistics](#) (3 EC)

This course provides students with the statistical tools that are most important for biologists. In June, students will go on a field trip where they will collect field data that are subsequently analysed with statistical software (e.g. R and SPSS).

### 5.3 Other Courses

As stated above, MEME students typically complement the 30 EC course programme of their first semester with a 15 EC package of courses in their second semester. However, the courses listed above can also be taken in the fourth semester. Moreover, all partner universities offer more MSc-level courses that may be interesting and useful. For example, students who want to conduct experiments with animals might need to take a course on animal experimentation first. In this section, we list some of these additional MSc-level courses. For a complete list and detailed information, students should consult the websites of the partner universities.

#### 5.3.1 Groningen

- [Advanced Self-Organization of Social Systems](#) (5 EC)
- [Advanced Statistics](#) (5 EC)
- [Animal and Human Experimentation](#) (5 EC)
- [Current Themes in Ecology and Evolution](#) (2 EC)
- [Mathematical Models in Evolution](#) (6 EC)
- [Molecular Methods in Ecology and Evolution](#) (5 EC)
- [Polar Ecosystems](#) (5 EC)
- [Programming C++ for Biologists](#) (5 EC)

#### 5.3.2 Montpellier

Check the local programme (usually in French) with the local coordinators.

#### 5.3.3 Munich

- [Computational Methods in Population Genetics I & II](#) (3 EC)
- [Experimental Evolutionary Ecology](#) (3 EC)
- [Hot Topics in Evolution, Ecology and Systematics](#)
- [Marine Biology](#) (3 EC)
- [Multivariate Statistics in Ecology and Quantitative Genetics](#) (3 EC)
- [PERL for Beginners](#) (3 EC)
- [Transcriptome Analysis in Evolution](#)

#### 5.3.4 Uppsala

- [Applied Ecosystem Ecology](#) (15 EC)
- [Ecotoxicology](#) (15 EC)
- [Fundamental and molecular systematics](#) (10 EC)



- [Genes, Brain and Behaviour](#) (15 EC)
- [Modelling in Biology](#) (5 EC)
- [Population and Community Ecology](#) (15 EC)
- [Trends in Molecular Biology and Biotechnology](#) (15 EC)

## 5.4 Electives

In addition to coursework and research projects, students can get credits for “electives.” We use this term to characterize science-related activities that allow students to expand and deepen their knowledge, to acquire or improve academic skills, or to further their career in other ways (e.g. by attending a scientific conference or a traineeship at a potential employer). For example, students can obtain credits for being involved in the organization of scientific events (e.g. a literature club, workshop or a MEME summer school) or taking responsibilities furthering science (e.g. acting as student speaker). They can also visit other labs to learn new techniques, or do an internship at a museum, a school, a scientific publisher, or an NGO. It is also possible to get credits for writing a publication (if this is not part of a research project).

The possibility of obtaining credits for electives is subject to the limitation that electives must be clearly related to science. Non-scientific activities (like following a languages course) cannot be included in the electives. Since electives are often non-standard elements of an MSc curriculum, it is important to discuss beforehand (with the mentor or the local coordinator) whether an intended scientific activity can be included among the electives, how many credits can be assigned for this activity, and which rules must be followed in order to make these credits “count” for the degree requirements. In Groningen, for example, electives need to be (co-)supervised by a professor, and clear arrangements have to be made (beforehand!) as to the learning goals, the overall set-up, and the quality and intensity of supervision.

## 5.5 Research projects

<b>Semester 3 – All partners (only internal projects)</b>	
Groningen	First thesis project (30 ECTS)
Uppsala	Thesis project (30 ECTS)
Munich	Thesis project (30 ECTS)
Montpellier	First thesis project (30 ECTS)

<b>Semester 4 – All partners (external projects possible)</b>	
Groningen	Second thesis project (30 ECTS)
Uppsala	Research project (30 ECTS)
Munich	Research project (30 ECTS)
Montpellier	Second thesis project (30 ECTS)

The MEME programme has been designed for providing students an optimal training for a subsequent PhD project and eventually a career in scientific research. We strongly believe that the most effective way for a student to learn how to do research is by conducting their own research project under close supervision by an experienced researcher. The student becomes a junior member of the research group and participates in the research meetings, literature clubs, and discussion events. Students in the MEME programme will spend at least

half of their time (60 EC) doing research, carrying out at least two different projects. At least one of the research projects (the first one) must be a 30 EC “thesis project” that results in a “Master’s thesis.” A Master’s thesis is an important piece of work since it is tangible proof that the student has gained sufficient research experience to tackle a substantial research problem and to report on the results in a manner that is in line with common scientific practice. In many cases, the results of a thesis project will be presented at an international conference or published in a peer-reviewed scientific journal. This way, the research experience of a thesis project will make students actively contributing members of the international scientific community. Although research projects are key elements of the MSc programme at all partner universities, the exact regulations concerning these projects differ slightly between these universities. Below we explain the basic requirements to develop a research project in each of the universities. The first project, which is always carried out at one of the four partner institutions, shall be the thesis project, if only one thesis project will be done.

### **5.5.1 Groningen**

All the master research projects carried out by MEME students at the RUG are 30 EC thesis projects. During their project, students are expected to actively participate in seminars, literature discussions and lectures within the research group they have joined. As part of their project students must first write an introductory essay and give an introductory presentation to the research group explaining the objectives and research plan of their project. At the end of the project, they are required to write a report (thesis) and give a final presentation to the research group explaining their results. A scientific staff member of the research group will supervise the project, often in collaboration with a post-doc or a PhD student, who act as daily supervisor. Together the supervisors evaluate the project and provide feedback to the student. This feedback addresses aspects such as specification of a well-defined research question, review of the relevant literature, methods, data analysis, planning and organization, lab notebook, presentation of results, organization of the Master’s thesis, writing style, etc. The main supervisor will mark the student according to the grading system of Groningen (see Section 6.1). For more details see the RUG regulations for research projects that can be downloaded from the MEME website.

### **5.5.2 Montpellier**

In Montpellier, students can be involved in two different types of research project: short projects of 15 EC (3.5 months) or thesis projects of 30 EC (6 months). For the latter, students have to fulfil specific requirements. First, an introductory short report should be written, stating the research questions, the research plan of the project, and the methods to be used. This plan is commented by a panel of senior scientists. At the end of their project, students must write a report. At least two staff members, not including the supervisor, will review the report. Finally, a ten-minute talk and a defence of the project will take place in front of the thesis defence committee, which will determine the grade for the project. This committee will be composed of staff members including the reviewers of the short report; though not impossible, in most cases the supervisor of the project is not part of this committee.

### 5.5.3 Munich

There are two different kinds of 30 EC projects at the LMU: research projects and thesis projects. This is because the degree requirements of the LMU only allow for one master's thesis to appear on a student's transcript or diploma. Thus, students who wish to receive a degree from the LMU must designate one of their 30 EC projects to be the "thesis project." The two types of projects are essentially the same in terms of the time required and the day-to-day work of the student. Both projects require a final written report. However, the thesis project (in the 3<sup>rd</sup> semester) must follow some extra [guidelines](#). For example, three bound hardcopies of the thesis report must be provided to the EES office. For both research and thesis projects, students are expected to participate in the day-to-day activities of the group in which they are working (such as seminars, and journal clubs), and to present their results to the group. The final grade is given by the official supervisor of the project, who must be a member of the LMU Faculty of Biology. It is also possible to do a short research project (up to 15 EC) at the LMU. These short projects are typically carried out during the second semester. They require a shorter written report and are also graded by the official supervisor of the project, who must be a member of the LMU Faculty of Biology.

### 5.5.4 Uppsala

Students can do several research projects at the UU. However, the first of these projects must be designated to be a "thesis project" and the second one a general research project. A thesis project must be 30 EC. During a research project, students are embedded in the research group of their supervisor and they are expected to participate in the activities of the group. At Uppsala all research projects are supervised by a staff member of the UU. A thesis (report) and an oral defence (in case of a thesis project) in front of the research group are required. The report includes a non-technical summary and a scientific abstract. The supervisor will grade the project on the basis of the presentation and the thesis. To show their capacity for critical thinking, students must also act as opponent on at least one other degree project within the same research area.

### 5.5.5 Harvard

In the 4<sup>th</sup> semester some MEME students have the opportunity to do a research project at Harvard University or the University of Lausanne, which are associated partners of the MEME consortium.

## 5.6 MEME summer schools

The annual MEME summer schools provide an ideal opportunity for the whole "MEME family" (the students of three cohorts, lecturers from all partner universities, organizers of the programme) to meet and exchange all kinds of information. The MEME winter schools provide a scientific and social programme for the students of one particular cohort, who see the school as a welcome reunion after having been spread out over different universities in the previous semester.

The MEME summer schools take place in the third week of August, one week before the student introduction weeks in Groningen and Uppsala. All MEME students have to participate in at least two summer schools, but typically students strive to take part in all

three (at the start of their first and second semester and at the end of their second year). In addition to the 60+ students, several invited lecturers and faculty from all partner universities will also be present.

A summer school starts with a special day for the new cohort of students. The students meet each other for the first time and they get the opportunity to introduce themselves to the group in a brief presentation. Various activities are organized to stimulate student-student communication and interaction. The MEME coordinators provide detailed information about the programme, such as the structure of the first and second semester, typical mobility schemes, and degree requirements. Faculty from all partner universities provide a brief overview of the local course menu and the research foci at their local institutes. Student representatives from all four universities (and from Harvard) give the new students an impression about “student life” at these places; they cover aspects like housing, public transportation, sporting facilities, cultural events, “must-see” places, recommendable pubs and restaurants, local student federations, and all kinds of local peculiarities. Last, but not least, alumni MEME students give an impression about “life after MEME.” The first day ends with a social get-together where the students have the opportunity of a chat with their future lecturers in an informal atmosphere.

The remainder of the summer school contains of a mix of a scientific programme, a social programme, and various evaluation meetings. The scientific programme mainly consists of lectures of the invited speakers, scientific talks of (junior) staff members of the organizing university, and presentations by the students who are about to graduate. In particular, the latter presentations are very inspiring, since they give the younger cohorts an impression of the diversity of research topics that can be tackled by MEME students and the level of knowledge and know-how that students can achieve within two years. In addition to talks, the scientific programme also includes activating elements, such as joint work on small group projects (where the new students are guided by students of the older cohorts). In addition to such activities, a summer school excursion and various social evening events help to create the feeling of being part of a vivid and interactive community.

The summer school also includes various evaluation sessions. First, the MEME Board Team meets with the student speakers of the two older cohorts in order to discuss problems encountered (at the local level or with the MEME programme as a whole) and suggestions for enriching or improving the programme. Second, the Board meets to discuss all kinds of issues, including the matters brought forward by the student speakers. Third, there is an overall “feedback meeting” where all students participate and exchange ideas. After this feedback meeting, the students of each cohort elect four student speakers for the coming year.

The summer school ends with a graduation ceremony, where all graduating students receive an Erasmus+ Certificate and the achievements of each student are individually recognized in a short speech by a member of the MEME Board. Typically, these speeches include some “words of wisdom” for each individual student, which were provided by the student’s mentor and supervisors. The summer school closes with a graduation party.

## 6 FINDING YOUR WAY IN AN INTERNATIONAL PROGRAMME

The MEME programme is part of the Erasmus Mundus initiative of the European commission. Erasmus Mundus masters are intended to enhance the quality of higher education in the European Union by promoting cooperation and mobility between European institutions and third-country partners. Students of the MEME programme will benefit from being part of different world leading institutions in the field of evolutionary biology. They will start building international networks with professors and other students that will maintain the benefits of cooperation and mobility in scientific research. Finally, they will learn to appreciate the academic and scientific traditions of several countries. Although exposure to different academic systems is a valuable experience, the differences between countries can also cause practical problems and in some cases even frustration.

For example, students of the MEME programme will soon realize that there are considerable differences in the academic calendar of the four partner universities. For the students going to Uppsala in their first semester, courses start in the final week of August; students going to Groningen start one week later, in the first week of September. In Uppsala, the first semester ends mid-January, while it continues until the first week of February in Groningen. Differences between academic calendars become even more apparent in the transition from the first to the second semester: courses start in the second week of February in Montpellier, while they do not start before mid-April in Munich. Accordingly, students moving from Groningen to Montpellier do not have a break between semesters at all, while students moving from Uppsala to Munich have a 3-month break. Fortunately, the MEME partners have found ways to cope with such logistic problems, for instance by offering additional courses or short research projects in the gaps between semesters.

There are many other differences between countries and, accordingly, the MEME partner universities. For example, the academic year in Groningen consists to 42 weeks of study or research, punctuated by two brief vacations (around Easter and Christmas) and a 6-week summer vacation. Courses tend to be organized in intense blocks of 6 weeks where students focus on one subject and spend the major part of the day at the university. In contrast, the academic year in Munich contains only 28 course weeks, while courses are often spread out and given in parallel at other universities. In a programme like MEME, students recognize such differences (which remain hidden to students studying at just one university), and it happens that students at one university get a bit jealous when seeing the seemingly more relaxed schedule at the other universities. You are well advised to suppress such feelings, since on closer inspection it turns out that the duration and intensity of study is much more comparable across countries than it appears at first sight. It is therefore best to expose yourself as much as possible to the local habits and traditions, in order to be able to judge their merits and drawbacks in the end. This way, the diversity you will be confronted with will turn into a valuable learning experience. Should you become an academic teacher in a later stage of your career, this experience will help you to design your courses in such a way that your students can indirectly profit from your evaluation of the various systems you have been exposed to during your time at the MEME programme.

## 6.1 ECTS mechanism and comparison of grades

The MEME programme makes full use of the European Credit Transfer and Accumulation System ([ECTS](#)), which serves as a formal instrument for structure, evaluation, and certification of academic work. All European partner universities have implemented the ECTS system for several years. One credit point (1 EC) corresponds roughly to 28 hours of study, and 60 EC correspond to the study load of one academic year. ECs are awarded for all academic work including contact hours, study time, course participation, taking notes, preparing and giving a presentation, preparing and taking an exam, writing a research paper and other research related activities.

Lecturers award grades according to their local grading system. To make grades comparable across the partner institutions, the grading scales are compared in Table 1. A similar table will appear in the diploma supplement. Yet, even with such a table at hand, it is not always possible to be completely consistent across countries. For example, it is relatively common that German students receive the highest possible grade (1.0), whereas this almost never happens in France or the Netherlands. The MEME Board will compare the grades given at the partner universities on a regular basis in order to ensure that grading is fair and, as much as possible, independent of where the student obtains the credit.

**Table 1.** A comparison of the grading systems used at the partner universities.

Groningen 10-1	Montpellier 20-1	Munich 1-5	Uppsala 5-1	Meaning
10	20	1.0		Excellent, outstanding performance
9	18	1.3	5	Excellent, pass with distinction
8	16	1.7		Very good, above average
7.5	14	2.3	4	Good, pass with credit
6.5	12	3.0	3	Satisfactory, pass
6	10	4.0		Sufficient, meets the minimum criteria, pass
5	9	4.3-4.7	U	Fail, Unsatisfactory
4-1	9-1	4.7-5.0	U	Fail, Unsatisfactory

## 6.2 Obtaining a double degree

MEME strives for accreditation as an international joint degree programme, but at present legislation in the partner countries still makes this impossible. For the time being, MEME is a double-degree programme. This means that, upon completion of their programme, MEME students will be awarded with MSc diplomas from two partner universities. In addition, MEME graduates will obtain a certificate for the successful completion of the MEME programme as a whole and a supplement to this certificate. This supplement explains the international nature of the MEME programme and the grading schemes at the various universities, and it includes a joint transcript with all study modules followed in the two years (including credits, grades, and the university where the module was completed).

## 6.3 Educational organisation

To find their way through their educational programme, students need to have at least some limited knowledge about the organisation underlying this programme. This is more challenging for an international programme like MEME than for a local programme. MEME students always have to cope with two levels: the local organisation at the university where they are registered at in a given semester, and the overarching organisation of the MEME programme as a whole.

### 6.3.1 MEME Board and educational committees

All important decisions affecting the MEME programme as a whole are taken by the Management Board of MEME (or simply the “MEME Board”). These include the rules and regulations of the programme, admission of new students to the programme, termination of scholarships, and strategic decisions on the future of the programme. The MEME Board consists of the local coordinators and the administrative coordinator of MEME (see p.4 of this guide for the contact details of the Board members):

#### Management Board of MEME:

- Prof. Dr. Leo Beukeboom – local coordinator at the University of Groningen and director of the MEME programme, chair of the MEME Board;
- Dr. Sandrine Maurice and Dr. Yannis Michalakis – local coordinators at the University of Montpellier;
- Prof. Dr. John Parsch – local coordinator at the LMU Munich;
- Prof. Dr. Jacob Höglund – local coordinator at Uppsala University;
- Femke Schouten – administrative coordinator of MEME (located in Groningen).

Three educational committees advise the board in various matters. The MEME Admissions Committee is strongly involved in the selection and admission of new students (see Section 8.2). The committee organizes the selection procedure and ranks the applicants on the basis of written material and interviews. Based on the conclusions of this committee, the MEME Board takes a final decision on admission and ranking (which may be important for obtaining an Erasmus Mundus scholarship (see Section 9.2). The MEME Examination Committee advises the MEME Board in all matters regarding the recognition of study modules (e.g. electives; see Section 5.4), the assignment of credits and grades, the fulfilment of the requirements for issuing a MEME certificate (see Section 6.2), and the termination of an Erasmus Mundus scholarship (see the Student Agreement in the appendix to this guide).

#### Admissions and Examination Committee of MEME:

- Prof. Dr. Leo Beukeboom, University of Groningen, chair of the committee;
- Dr. Yannis Michalakis, University of Montpellier;
- Dr. Philomena Bodensteiner, Ludwig Maximilians University of Munich;
- Prof. Dr. Jacob Höglund, Uppsala University.

### 6.3.2 Local organisation

Each semester, MEME students are registered at one of the partner universities, where they are fully embedded in a local Master’s programme. As explained in Section 4, all MEME students have to satisfy the requirements of these local programmes (which are often adapted to the special situation of MEME students). All these programmes have their own

executive boards and their own curriculum and examination committees. The MEME courses, for example, are all evaluated by the local curriculum committee, and the local examination committee plays an important role in deciding on whether a student satisfies the local degree requirements. It is imperative that MEME students make themselves familiar with the local rules and regulations and with the local educational organisation that is responsible for implementing these regulations. A good starting point is the Study Guide of the local programme, which (if available) can be downloaded from the [MEME website](#). On the website, students can also find links to the local organisations. Additional information will be provided by the local MEME coordinator (see Section 6.3.1).

### **6.3.3 International Offices**

All partner universities have international offices dedicated to assist foreign students with all issues related to moving to another country and finding their way in an often quite different educational systems. The local MSc programmes and the local MEME offices closely collaborate with the local international offices, and solutions to student problems are often found in a joint effort. The international offices organize all kinds of social activities and events, they advise student in making optimal use of local facilities (such as libraries, IT infrastructure, sporting facilities), they offer special services for students with families and students with special needs, they help students with visa issues, and they assist students in finding housing or language courses.

It is important to realize that all these services may take considerable time. It is therefore important to contact the local MEME office well in advance before moving to another university (preferably 3 months before the move). The local MEME office can then contact the International Office and advise the students on which documents they need and which local requirements they have to fulfil.

## **6.4 Mentoring**

During their first semester at either Groningen or Uppsala, each student chooses a personal mentor. The mentor helps their mentees with all issues arising during the first semester and advises their mentees regarding their “study trajectory” in future semesters. At all times, and in particular when moving to a different university, students have the opportunity to choose a new mentor. The mentor acts as a coach and should create a bridge between the student and the “organisation” (e.g. the MEME Board or the Examination Committee at the local university).

The mentor is responsible for:

- advising mentees in setting up their individual study plan and formally approving this plan;
- ensuring the scientific and supervision quality of those study modules that are not part of the standard curriculum of the MEME programme (e.g. electives);
- assessing and monitoring the incoming grades and written reports and discussing them with their mentees;
- evaluating the student’s progress, capabilities and limitations
- reporting the student’s progress at the end of each semester to the MEME Examination Committee (see the Student Agreement in the appendix to this guide).



The student is responsible for:

- requesting additional meetings if necessary;
- providing information requested by the mentors;
- coming forward when there is a problem that the mentors may not be aware of.

The mentor will also discuss the following coaching issues with the student:

- general career aspirations and network activities;
- anything that might prevent the student from achieving her/his objectives;
- awareness and education about cultural and gender issues in career development.

## 7 LOGISTIC ISSUES

### 7.1 Registration, visa, residence permits

The International Office of the university where you want to register (or where you are already registered) takes care of all visa and residence permit applications of all prospective and current international students. In a first step, students need to register at the university before they can subsequently apply for a visa. Since visa regulations strongly depend on the student's country of origin we can only give some general advice. For more detailed recommendations, you should contact the local MEME office, the local international office, or ask current MEME students (preferably compatriots) for advice. The [MEME Facebook](#) pages are ideally suited for exchanging this kind of information.

Holders of a valid EU passport are advised to use that passport for registration at the university (even if they hold non-EU passports as well). Registration is much easier in such a case, and a visa is not required. This does not only save money for the student, but also for the MEME programme, since tuition fees are typically lower for EU residents than for non-EU residents (see Section 9.1). Holders of non-EU passports will get a "Provisional Residence Permit" stamped in their passport, permitting them to enter the country. Once in the country, they will need to apply for a long-stay visa, which is valid for 1 or 2 years. This permit has to be collected within a certain time frame (usually 1-2 months) and allows the student to travel to other [Schengen](#) countries for up to 90 days within the next six months. Once in Europe, holders of non-EU passports need to apply for the next visa (for the next university). It is advisable to inform beforehand which documents are needed for the subsequent visa applications, since otherwise you may leave required documents in your home country.

Costs of visa/residence permits are different per country, but students should be prepared that they may amount to €200-€300, with additional administration fees on top of that. For students coming to Groningen for their semester the Immigration Service Desk fully cares for the visa/residence permit application.

### 7.2 Accommodation

Finding suitable accommodation may be one of the biggest logistical challenges. With the exception of Montpellier, the partner universities do not supply student housing (halls of residence) on a large scale. However, all universities have housing offices that help students finding accommodation. In addition, local student networks, the MEME students from previous cohorts (e.g. via the [MEME Facebook](#) pages) and the members of the local research group all assist incoming students with finding suitable accommodation. In all cases, it is strongly advisable to start searching for accommodation way before you arrive.

#### 7.2.1 Groningen

For finding accommodation, the University of Groningen cooperates with a [Housing Office](#). Be prepared that housing is scarce in Groningen, in particular at the start of the winter semester. It is therefore advisable to apply for accommodation as early as May. Rooms offered by the housing office are often relatively small, some distance away from campus, and/or quite expensive. It may therefore be a good idea to check alternatives to the housing

office, such as local student networks, other MEME students, or the local research group (see above).

### **7.2.2 Montpellier**

There are two main types of accommodation while studying:

- university accommodation – such as halls of residence;
- private accommodation – house and flat rentals.

University accommodation can usually be obtained if asked early enough (end of June – early July for the fall semester, early December for the spring semester). Accommodation must be asked at the international office during the registration process. The number of private student residences is on the increase, making it easier to find private student accommodation in France. Like in other countries, students can also choose to share a private larger accommodation.

### **7.2.3 Munich**

Of all partner universities, accommodation is the most severe bottleneck in Munich. The [Studentenwerk](#) (student services) offers limited university housing. The rooms are furnished and cost €200-€280 with a deposit of €300.

LMU exchange students will be able to apply for housing during the registration process with the International Office. All others need to apply directly to the Studentenwerk, using an [Online Application Form](#). If you receive a housing offer, you need to confirm the reservation. The rental agreement will be signed upon your arrival in Munich. The Studentenwerk cannot take special requests for rooms (single, double etc.) into account, and the International Office has no influence on the selection process.

### **7.2.4 Uppsala**

The [University Housing Office](#) offers furnished accommodation for both students and guest researchers in different areas of Uppsala. All housing options include basic furnishing. Electricity, water and heating are always included in the rent. Apartments with a kitchen or kitchenette have kitchen utensils. Bed size is normally 200x90cm. Internet is provided in all student rooms, but not in all apartments for researchers.

If you choose to go to Uppsala, your contact details will be forwarded to Henning Blom ([Henning.Blom@ebc.uu.se](mailto:Henning.Blom@ebc.uu.se)) and he will contact you by e-mail with a Welcome letter and additional information on how to apply for housing.

### 7.3 Insurance

All MEME students with an EMJMD scholarship will receive an insurance policy with international coverage as dictated by the EU. The costs of this policy are covered by the scholarship (see Section 9.1). Self-funded MEME students are required to take out their own insurance with adequate coverage according to the rules of the different partner universities. MEME will advise self-funded students to take out the same insurance as recommended by the EU.

Students should be aware that the insurance has limited coverage. The coverage includes all emergencies like visits to the doctor/hospital/ER in case of accidents or sickness. It may not cover services (like dental care) that students might be used to from their home country. Students are therefore strongly advised to consult the insurance policy in detail for coverage. In case that the insurance policy does not meet their needs, students are free to get additional insurance. Unfortunately, this does not imply that the Erasmus+ insurance for scholarship holders can be cancelled.

### 7.4 Scholarship payment

For those students receiving an Erasmus Mundus scholarship (see Section 9.2), the first monthly payment will be made to the bank account the student has specified on the Scholarship Acceptance form. This way, new students have access to this money upon their arrival to their first MEME destination. All subsequent payments can only be made to an EU IBAN bank account. Therefore students without a European bank account need to set up an EU bank account as soon as possible after arrival. Whenever students change their bank account, the administrative coordinator ([f.a.schouten@rug.nl](mailto:f.a.schouten@rug.nl)) will assist students in arranging that the subsequent monthly payments will be made to the new account.

**Important:** opening a new bank account and having it registered in the payment system of the University of Groningen may take considerable time (up to 15 days). To ensure that the next monthly payment arrives in time at the new bank account, MEME needs to be informed about the new bank details before the 10<sup>th</sup> of the month. To ensure their monthly payments, scholarship holders also need to think ahead when moving between MEME countries. For example, students studying in Uppsala have to close their Swedish bank account before moving to their next destination.

Students receive their monthly scholarship payments before the start of the month (i.e. at the end of the preceding month). Scholarship holders with a travel budget will receive the first half of their travel budget in September of their first year or as soon as they have opened an EU bank account. The second half of the travel budget will be paid in June of the following year.

## 8 ADMISSION TO MEME

### 8.1 Admission criteria

MEME is an international MSc programme that is designed for providing students an optimal training for a subsequent PhD project and eventually a career in scientific research. On purpose, all study elements strive to approach the borders of our knowledge and capabilities in the field of evolutionary biology. In comparison to other programmes, the emphasis is less on teaching textbook knowledge and more on discussing the gaps in this knowledge and potential ways toward filling these gaps. This approach is very stimulating, but it can also be highly challenging. Moreover, the MEME programme places much emphasis on activating students to detect gaps in our current knowledge themselves and to come up with possible solutions. For this reason, MEME classes are less based on the “consumption” of lectures, but often consist of discussions and problem-oriented working in small groups. For all these reasons, the MEME programme has to be highly selective and can only accept students whose motivation, intellectual abilities and communication skills fit well to the overall goals of the programme.

To be admissible for MEME, applicants have to provide evidence that they

- have a genuine interest in evolutionary biology and its many facets;
- have a strong motivation for doing research in an area related to evolutionary biology;
- have sufficient background knowledge in evolutionary biology or neighbouring disciplines (e.g. ecology or systematics) to be able to participate in high-level debates and discussions on topics related to evolutionary biology. A general guideline is: 50% of the BSc courses should be biology related of which 20% also related to evolution;
- have the intellectual ability for following a strongly research-oriented programme;
- have strong communication skills, including a very good proficiency in English;
- have the ability to integrate well in an international and multi-cultural community of students.

Interested students can apply to the programme via the [MEME website](#). To be able to judge whether applicants meet our requirements, the application package must include:

- a completely filled online application form;
- an informative curriculum vitae of the candidate;
- a letter of motivation (very important!) explaining in considerable detail why the candidate is applying for the MEME programme and why the candidate considers herself/himself suitable for the programme;
- proof that a degree in Biology or a closely related field has been obtained (or will be obtained before the start of the next academic year); this degree should be equivalent to or higher than a European Bachelor of Science (BSc);
- an official university transcript allowing to judge the academic background and achievements of the candidate; this transcript should include a list of all courses taken, the credit hours, the final grade received, an explanation of the grading system used, and an indication of the student’s rank within her/his cohort (including cohort size);
- certification of proficiency in English (e.g. Cambridge Certificate of Proficiency in English, IELTS, TOEFL) (consult the [MEME website](#) for the minimal requirements);

- at least two (preferably three) letters of reference to be sent separately by referees (making use of the MEME reference form).

All applications are evaluated systematically according to well-specified criteria (see Section 8.2). As a rule, candidates must be judged as very good (top 20%) on most criteria to be admitted to the MEME programme.

## 8.2 Selection and admission procedure

All applications to MEME have to be submitted via the MEME website (see Section 8.1). They are evaluated in a three-step procedure.

In a first step, the Admissions Office of the University of Groningen (in close collaboration with the MEME Office in Groningen) checks whether the application files are complete and whether the minimal requirements are met (background; degree equivalent to European BSc; proficiency in English). All applicants not meeting the minimal requirements are informed that their application will not be processed further.

In a second step, all remaining applications are evaluated and ranked by four selection teams at the partner universities. Each team is chaired by the local member of the Admissions Committee (see Section 6.3.1). Each application will receive scores ranging from 1 (lowest) to 10 (highest) for four evaluation criteria: academic background; motivation; past achievements (e.g. grades obtained); and references. Based on the average scores, each selection team produces a ranking of the applicants, also pointing out special circumstances where the numerical score does not fully capture the suitability of an applicant. Subsequently, the Admissions Committee consolidates the four local rankings into an overall ranking. Moreover, the committee decides on the eligibility of candidates on the basis of the written information available. All applicants not considered eligible are informed about this judgment. They are also informed that they can appeal against the committee's judgement by sending an email to the coordinator of the MEME programme.

In a third step, all remaining candidates are invited to participate in a Skype interview. The applicants will be notified well in advance about the structure of the 20-minute interview and all technical details. Each applicant is interviewed by a small team of experienced interviewers. At the start of the interview, the applicants are requested to identify themselves by an official identification document. Immediately after the interview, each interviewer gives six scores for the following aspects: presentation ability; ability to handle questions; breadth and depth of knowledge; communication ability (including proficiency in English); motivation; overall impression. The interviewers also indicate whether, based on the interview, they consider the candidate eligible for MEME. The interviewers' scores are combined in an overall interview score, which in turn is combined with the score of the second round of selection (both scores having equal weight), resulting in a final score and a ranking of candidates. Subsequently, the Admissions Committee convenes and produces a final ranking of candidates and a recommendation to the MEME Board about whether any given candidate is considered eligible for MEME or not. The MEME Board then takes the decision on selection and ranking (the latter is important for obtaining a scholarship; see Section 9.2). The final decision of admission lies with the admissions offices of the local universities. All candidates are informed about the outcome as soon as possible. All selected

students will be sent an official admission that indicates the university where the students will follow their first semester.

### **8.3 Time line**

Each year, the application deadline is on the 15<sup>th</sup> of January of the calendar year where the new MEME cohort starts (in August). Information regarding the application procedure will be made available on the MEME website at least six weeks before the deadline. Application is only possible via the [MEME website](#) and making use of the official application forms. Applications arriving after the deadline will not be taken into consideration.

The first two rounds of selection take place January and February. Applicants to be invited for an interview will be notified about this by email at the beginning of March. All other applicants are notified that they are not eligible for the MEME programme. The third round of selection (the interviews) takes place in March. All applicants are notified about the final outcome at the beginning of April. This notification specifies whether the applicant is admitted to the MEME programme and also explains the appeal procedure. The top-ranked applicants are also informed on whether they will be offered an EMJMD or a consortium scholarship and on their position on the scholarship reserve list.

## 9 PARTICIPATION FEES AND SCHOLARSHIPS

In comparison to “regular” MSc programmes, MEME has many special features and services that all come with some costs. We are running a central MEME office; dedicated support staff is available at all partner universities; many people are involved in our elaborate selection and admission procedures; we are organizing summer and winter schools; etc. To cover these expenses, MEME has to charge a participation fee from its students. A limited number of MEME students will be awarded an Erasmus Mundus scholarship, which does not only cover expenses for living, accommodation and traveling, but also the MEME participation fee. Other students may profit from other scholarship programmes or obtain a student loan. All self-funding students can apply for a partial waiver of the MEME participation fee.

### 9.1 Participation fee

The MEME participation fee amounts to € 9,000 per year for so-called Category A students and to € 4,500 per year for Category B students. Students belong to Category B if they are nationals of the so-called Programme Countries; these are all EU countries plus FYROM (Former Yugoslav Republic of Macedonia), Iceland, Liechtenstein, Norway, Serbia and Turkey. Moreover, students who were residents or have carried out their main activity (studies, training or work) for more than a total of 12 months over the last five years in one or several Programme Countries are classified as a Category B. All other students belong to Category A. For more details, please consult the [Erasmus+ Programme Guide](#) (page 24).

The MEME participation fee covers all tuition fees that have to be paid when registering at a MEME partner university (including Harvard and Lausanne). The universities charge tuition fees in order to be able to offer facilities like libraries, ICT infrastructure, or well-equipped labs for student practicals or research projects. The differences in participation fee between Category A and Category B students is mainly related to the fact that tuition fees are often much higher for non-EU students than for EU students. In fact, the MEME participation fee of € 9,000 is actually a bargain for non-EU students considering to study in Groningen or Uppsala, since it includes the much higher annual tuition fees for non-EU students at these locations (€ 17,500 in Groningen, € 16,300 in Uppsala). In some cases, the local degree requirements (see Section 4.2) necessitate that a MEME student registers at two partner universities at the same time. It is worth noting that this does not create any additional costs for the student, since double tuition fees are covered by the MEME participation fee as well.

In addition, the MEME participation fee covers the costs of one language course per semester, and the participation costs in the MEME summer schools. The participation fee does in general not cover expenses for travelling and accommodation, although in some cases such expenses will be sponsored by the programme. In particular, summer schools, excursions, and participation in international conferences are often subsidized by MEME.

Self-funding MEME students who cannot afford the MEME participation fee can apply for a partial participation fee waiver. If such a waiver is granted, the participation fee is reduced by 33%. Hence the participation fee is reduced to €6,000 per year for Category A students and to €3,000 per year for Category B students. The number of participation fee waivers per cohort is limited. Interested students should contact the administrative coordinator ([f.a.schouten@rug.nl](mailto:f.a.schouten@rug.nl)) for further details.



## 9.2 Erasmus Mundus scholarships

Each year, a number of 'Erasmus Mundus scholarships' is available to highly qualified students participating in the MEME programme. There are two types of Erasmus Mundus scholarships: EMJMD scholarships that are made available by the European Commission and consortium scholarships that are financed by the four European partner universities participating in MEME.

An **EMJMD scholarship** for Category A students represents a total maximum value of €49,000. In a nutshell, this EMJMD scholarship covers:

- the MEME participation fee of € 9,000 per year;
- a contribution of € 24,000 to accommodation and living expenses (in 24 monthly payments of € 1,000);
- if the place of residence at the time of application is in a Partner Country:
  - a contribution of € 1,000 to installation costs (once);
  - a contribution of € 2,000 (resp. € 3,000) per year to travel costs for scholarship holders whose country of residence is situated less than 4,000 km (resp. 4,000 km or more) away from Groningen;
- if the place of residence at the time of application is in a Programme Country:
  - a contribution of € 1,000 per year to travel costs
- health and liability insurance according to the minimum requirements of the Erasmus+ Programme

An **EMJMD scholarship** for Category B students represents a total maximum value of €40,000. In a nutshell, this EMJMD scholarship covers:

- the MEME participation fee of € 4,500 per year;
- a contribution of € 24,000 to accommodation and living expenses (in 24 monthly payments of € 1,000);
- if the place of residence at the time of application is in a Programme Country:
  - a contribution of € 1,000 per year to travel costs
- if the place of residence at the time of application is in a Partner Country:
  - a contribution of € 1,000 to installation costs (once);
  - a contribution of € 2,000 (resp. € 3,000) per year to travel costs for scholarship holders whose country of residence is situated less than 4,000 km (resp. 4,000 km or more) away from Groningen;
- health and liability insurance according to the minimum requirements of the Erasmus+ Programme

Due to EU regulations, EMJMD scholarship holders face some restrictions. Most importantly, they lose part of their scholarships when spending study periods in their country of residence or (only for category A students) if they stay for more than 3 months in another Partner country. For detailed information on EMJMD scholarships (and the rules and regulations associated with these scholarships) please consult the [Erasmus+ Programme Guide](#).

Decisions on EMJMD scholarships are mainly based on the ranking of students resulting from the selection procedure (see Section 8.2). However, the ranking does not automatically

result in the assignment of scholarships, since the latter is subject to some constraints. For example, per cohort not more than three students from the same country can be awarded with an EMJMD scholarship in the same cohort. Moreover, some students (who have received EU support before) are excluded from receiving EMJMD scholarships. For the detailed regulations, we again refer the reader to the [Erasmus+ Programme Guide](#).

In addition, a number of consortium scholarships may also be available (for Category A and for Category B students). A consortium scholarship covers:

- the MEME participation fee of € 9,000 per year (for Category A students) or € 4,500 per year (for Category B students);
- a contribution of € 12,000 to accommodation and living expenses (in 24 monthly payments of € 500);
- a contribution of € 500 (resp. € 1,000) per year to travel and installation costs for scholarship holders whose country of residence is situated less than 4,000 km (resp. 4,000 km or more) away from Groningen.

It is crucial that Erasmus Mundus scholarship holders choose a study mentor at the start of the programme. The mentor will evaluate the progress of the scholarship holder each semester and reports this in a progress report. Erasmus Mundus scholarship holders who do not make sufficient progress may lose their scholarship. The conditions under which this may occur and the procedure followed in such a case is specified in the Student Agreement that each scholarship holder has to sign. A copy of this agreement can be found [on the MEME website](#).

### **9.3 Other scholarship opportunities**

Many countries have set up funding (or study loan) schemes for master students participating in prestigious MSc programmes. For example, Latin American countries like Brazil, Colombia and Mexico have established scholarship programmes that are particularly targeted at European MSc programmes. In addition, there are various international scholarship programmes, and the EU has established a loan system as well. All these funding schemes have their own rules and restrictions. The MEME coordinators are no experts in this area, and they have only limited possibilities in assisting student to find suitable funding. However, they can provide students who have been admitted to the programme with an acceptance letter and (if needed) with additional letters supporting their application for a loan or a scholarship.

MEME students come from all over the world, and many of them have found external funding themselves. It may therefore be a good idea to consult compatriot MEME students on funding opportunities, for instance via the [MEME Facebook](#) pages for prospective students. These students may have many other hints and tips, and they can supply prospective students with reliable information on the expected expenses for living and housing at the partner universities.

All partner universities have web pages with links to funding opportunities, such as the [“grant finder”](#) of the University of Groningen. All partner countries have academic exchange organisations, such as the German [DAAD](#) or the Dutch [Nuffic](#) and [Study-in-Holland](#). Additional links can be found on the MEME website.