



emPLANT
master to suc**seed**

COURSE

CATALOGUE

SLU SEMESTER 1

emPLANT COURSE CATALOGUE
ERASMUS MUNDUS MASTER PROGRAMME IN PLANT BREEDING

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Joint Courses

JOINT COURSES	Description, contents, learning outcomes	Prerequisites	Implementation:	ECTS
Pilot case	<p>Semester 1 and 2: UniLaSalle, SLU Semester 3: UH, UPV, EgeU</p> <p>The pilot case is a case study to apply the project management tools to a breeding program. First students by group have to choose a species to be ameliorated. Then, find a character or several ones as goal for the breeding strategy. The students need to check the market potential for this new variety and verify that farmers will want to cultivate it. Secondly, students will define the potential market for their product (seeds), but also the market for the new variety (consumers). Thirdly, they need to create a structure to breed the new variety, and define the role of each student of the group in this structure (company, association...).</p>	No prerequisites	<p>The introduction to the Pilot Case will take place during the Joint Integration Week where the groups will be formed based on the specialty chosen by the students for Y2. During the first year the students will work in groups with their tutors and via telephone/video conference/email if group members are not located at the same site (LAS/SLU). During S3 the Pilot Case will be finalized with the tutors at the host university and by telephone/video conference/email among the group members. Two juries will be organized. The first jury at the end of S1 will evaluate the content and the form of the work and especially the project management content. At the end of S2 a written report will be evaluated. At the end of S3 a jury composed of the local tutors, the Coordinators for Y1 and an expert in Project Management will judge the defense of the Pilot Case. The students of S1 and S3 will be able to attend their respective presentations. The juries of S1 and S3 will be carried out on the same day for logistic reasons.</p>	<p>S1: 3 S2: 3 S3: 2</p>

Semester 1 SLU

SEMESTER 1 SLU	Description, contents, learning outcomes	Prerequisites	ECTS
Plant growth and development, (Uppsala University)	<p>The course will focus on mechanisms that regulate the different phases of plant development at the molecular, cellular and organismal levels. It is based on recent research in plant physiology, molecular plant biology and developmental genetics. Plant growth and development is genetically regulated but governed in large also by integration of external signals. For example, many species do not flower until they have been exposed to a longer period of cold temperatures. Thus the course will deal with hormones as well as effects of for example light and temperature on plant development, throughout the plant life cycle.</p> <p>The course focuses on mechanisms on the molecular, cell and organism level that control the different phases in the development of the plant such as embryogenesis, germination, vegetative growth and reproductive growth.</p>	120 credits including alternative A)/60 credits biology and 30 credits chemistry or 30 credits earth sciences; alternative B) 90 credits biology.	15
Genetic diversity and plant breeding	<p>After completion of the course the student is expected to be able to:</p> <ul style="list-style-type: none"> - Explain the concept of genetic diversity and how evolutionary processes and domestication affect genetic diversity - Explain concepts of quantitative genetics, breeding methods and regulations for the development of plant varieties - Understand principles of mapping quantitative traits in plant genomes and how to use this as a first step towards the identification of genes controlling phenotypic traits - Broadly explain next generation sequencing technologies and perform basic sequence analyses - Describe different biotechnological applications within plant breeding - Independently search, summarize and interpret literature within the topics covering genetic diversity and/or plant breeding and present this information in writing and orally - Conduct laboratory work to demonstrate genetic diversity at the molecular level, compile the results and write a lab-report. <p>The course deals with issues within evolution, domestication and breeding. More specifically it focuses on different reproductive systems and their breeding strategies, on the use of next generation sequencing technologies to sequence whole genomes and their applications in breeding. Important qualitative and quantitative plant traits will be high-lighted both genetically and phenotypically. Practical exercises are parts of the course including both wet lab, phenotyping of plants and computer exercises. Application of molecular marker systems in selection processes as well as other methods in plant biotechnology constitutes a section of the course besides bioethical aspects. Legislation connected with variety production and the ownership of variety material will be discussed.</p>	<p>Knowledge equivalent to 180 credits including 90 credits Biology and English B from upper secondary school or equivalent.</p> <p>As an alternative to the above, equivalent to 120 credits including 60 credits Biology of which at least 5 credits Genetics and at least 5 credits Plant Biology/Plant Physiology must be included. English skills equivalent to English B from upper secondary school.</p>	12

Swedish as a foreign language	The topics range from introducing and telling about oneself to greetings, family, food, shopping, weather and telling the time. The topics also include daily activities, living, transport and the immediate surroundings. The aim is to introduce students not only to the basic structures of Swedish, but also to the Swedish way of life. Simple everyday conversation is practised.	No prerequisites	2
Spanish as a foreign language	This language course is targeted at students who chose UPV as Y2 destination and who still need to bring their Spanish to a B2 level for everyday life and professional situations. Students will learn Spanish at the rate of 2 hours per week. In addition to classroom instruction, students will realize interactive assignments. This course is carried out in close collaboration with UPV so as to ensure that the students obtain the language level needed.	B1	2