emPLANT

master to sucseed

COURSE CATALOGUE

SLU SEMESTER 2

emPLANT COURSE CATALOGUE

ERASMUS MUNDUS MASTER PROGRAMME IN PLANT BREEDING

Contents

Joint Courses

JOINT COURSES	Description, contents, learning outcomes	Prerequisites	Implementation:	ECTS
Pilot case	Semester 1 and 2: UniLaSalle, SLU Semester 3: UH, UPV, EgeU 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...).	No prerequisites	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.	**S1: 3** **S2: 3** **S3: 2**
Intellectual Property & Plant Breeders' Rights	The two systems (plant patent and plant breeders' right) and implication for breeder rights will be studied. Breeder's exemption and farmer privilege will be analysed. From practical examples, lecturers from institutions and companies will analyse each system. Infringement cases and violations will be analyzed. UPOV origin and historical steps are presented. DCU and VCU notions. The transgenic varieties, the mutant and somaclonal variants will allow to introduce the notion of Essentially Derived Variety (EDV). Current and potential application of molecular markers and next generation sequencing will be discussed.	No prerequisites	This course will be offered in form of a UPOV (www.upov.int) online course. During one month, the student can access and complete 25h of online courses at their own rhythm. The course will be validated by a written online examination. SLU and LAS will nominate tutors who will accompany the students. In addition UPOV will nominate a contact person to accompany the students.	**S2: 2**

Joint Summer Breeding Field Camp (at the end of Y1 (June))	The objective of this summer intensive program is to immerge students in two crops breeding chains. One week for a major crop such as corn or wheat and the second on a legume or fruit crop (green bean, apple). During each week students are going to visit the main actors related to breeding for the selected crop from farmers, to several breeders (diversity conservation, breeding, laboratory) or public research institutions involved in basic research , seed industry and seed multiplication farmers and even food industry to see the quality requirements for the specific transformation. To have a full panorama of the selected crop. The main learning objective is to have an integrated view of the food chain from the breeding till the final transformation of the product. Secondary objectives are to understand the different actions of breeding companies, how they integrate the requests of the consumer. To have a deeper knowledge on at least two crops which are managed differently, as are the cereals sand the vegetables. And understanding the importance of the seeds quality.	No prerequisites	All students will join the field camp after the first year.	**S2: 2**

Semester 2 SLU

SEMESTER 2 SLU	Description, contents, learning outcomes	Prerequisites	ECTS
Molecular plant-microbe interactions, (Stockholm University)	The course covers different interactions between plants and microbes, including recognition processes and signal exchange. Applied and ecological aspects of symbioses and pathogen defense are discussed. The use of organismal databases to identify genes involved in interactions will be taught. The course integrates lectures, student seminars, group discussions, method presentations, and laboratory work and data analysis. The course covers the molecular mechanisms that are the basis for both symbiotic and pathogenic interaction between plants and microbes, including recognition processes and signal exchange (bacteria, cyanobacteria, fungi and viruses). The balance between symbiosis and parasitism, as well as applied and ecological aspects of pathogen defense and resistance responses are discussed. The use of organismal databases in the internet to identify genes involved in interactions is taught. The course integrates lectures, student seminars, group discussions, method presentations, laboratory work and data analysis. The course includes the following elements 1) Theory 2) Literature Review 3) research Project	Admittance to the course requires knowledge equivalent to a minimum of 30 credits in Chemistry and a minimum of 90 credits in Biology or Molecular Biology. Additionally, it requires a minimum of 15 credits on advanced level in the area of Molecular Life Sciences. Swedish upper secondary school course English B/English 6 or equivalent.	**15**
Biology and production of agricultural plants	This is a course for you who want to obtain a deeper understanding of the processes that regulate crop yield and product quality and, how they are influenced by cultivation measures, environment and plant material. Through specialisation and synthesis of knowledge in crop production biology you will be trained in your professional role and also for possible third-cycle courses and study programs. The teaching is to considerable part based on project work, both individually and in groups. In the course, literature seminars and one by the student chosen advanced assignment are also included. The course is mainly directed towards crops adapted to tempered climates and offers a specialisation and synthesis of knowledge within crop production science. The course to a large extent gives a basis for continued research within the subject area but also a training of the professional role. In lectures is treated: - Individual crop species and their use, e g to food, feed and energy. - How environmental factors and cultivation measures influence yield in different crops - Experimental methods, planning and interpretation of experimental results Compulsory learning activities: Project work, seminars, study visits and exercises.	Knowledge equivalent to 180 credits of which 90 credits Biology	**5**
Ethics	This course aims to help students develop their understanding of ethical aspects in professional roles and decisions-making. Through this course students will develop their: - Theoretical framework for explaining ethical dimensions in professional and personal decisions, - Awareness of different general ethical arguments and perspectives, and	Skills equivalent to 150 credits university studies. Skills equivalent to English B from upper secondary school.	**5**

	- Ability to analyze, present and argue for decision outcomes based on ethical grounds.		
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.	Course in S1	**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.	Course in S1	**2**