

SPECIALIZATION SEMESTER

AGROECOLOGY

30 ECTS *

From September to December



Learn project management and expand on application of agroecological science in real-world situations.

The students will learn to put together theoretical knowledge and past experiences to work in farming and food systems.

Courses at ISARA, France will start with a field trip to a selected region in France. Students will visit different stakeholders to analyse specific question on landscape and agricultural management such as constraints and potentials of the prevailing cropping and livestock production systems, or landscape and biodiversity management systems. In the second module, students

will gain applied knowledge on different agroecological cropping practices such as conservation tillage, direct seeding, intercropping, cover crops, and biological control.

The third module deals with the world ecosystems and their prevailing agricultural systems, but also with influencing factors such as economy, politics, land tenure or social issues. Students will learn which resource conservation techniques are feasible in the different agroecosystems, but also what role indigenous knowledge of farmers plays in traditional and modern agriculture.

The fourth module deals with the management of agroecosystems and implication from policies and nature conservation. Topics dealt with are for example agri-environmental measures, international conventions impacting agriculture, protected areas and agriculture, and ecological corridors in agricultural landscapes.

In the project management module, students will deal with different real -life projects. In groups they will analyse a demand from an external client or a research project during the whole semester. The objectives are to use different methodological and project management tools, and to apply disciplinary knowledge acquired in previous courses.

Total of ECTS	Contact hours						Project work
	Lectures	Tutorials	Practicals	Field trips	Supervised work	Evaluation	Project work
ECTS : 30	102.00 h	19.00 h	-	56.00 h	65.00 h	43.00 h	180.00 h

Personal work = Contact hours x2

* ECTS= European Credit Transfer System

Detailed courses and ECTS

Module 1: Agriculture and landscape management in a particular agricultural region *	Marion CASAGRANDE	Lectures	Tutorials	Practicals	Field trips	Supervised work	Evaluation	Project work
ECTS : 4		16.00 h	4.00 h	-	40.00 h	8.00 h	6.00 h	6.50 h

OBJECTIVE :

To discover and analyse an agricultural region and the constraints and potentials of the prevailing cropping and livestock production systems, the landscape management system as well as other economic activities such as agro-tourism.
To meet and interact with key stakeholders.

PROGRAMME :

Students will start this semester with a one week excursion and group studies in a selected region in France (e.g. Luberon) characterised by different environmental and agricultural production issues. Before this, they will get introductory lectures to the area and will be prepared with methodological tools (landscape analysis, agricultural production systems analysis, interviews) to carry out a group work. At the beginning of the field trip they will meet different stakeholders to understand the agricultural, economic and environmental characteristics of this area. After this, they will visit and inquire in different groups other stakeholder to analyse specific question such as constraints and potentials of the prevailing cropping and livestock production systems or landscape management system. Other topics will be the role of rural tourism, potential conflict issues such as nature conservation or water contamination, and rural development policy. A general feedback will be given by the groups of students in presenting their findings and analyses and discussed with the teaching staff.

TEACHING METHODS :

Classroom lectures
Literature study
Tutorials/Instruction
Field trips (one week)
Field work (meetings and interviews with stakeholder during excursion and transect work)

PREREQUISITES :

Basic knowledge of landscape management and cropping and livestock systems.

EVALUATIONS DETAILS:

- End of module 1 : Group work - Written document - 2/4 of the final grade
- End of module 1 : Group work - Oral presentation - 1/4 (Group) + 1/4 (Individual) of the final grade

Module 2: Agroecological cropping practices *	Aurélie FERRER	Lectures	Tutorials	Practicals	Field trips	Supervised work	Evaluation	Project work
ECTS : 7		27.00 h	3.00 h	-	8.00 h	13.00 h	12.00 h	47.00 h

OBJECTIVE :

To learn about different agroecological cropping practices and biological pest control.

To study soil related ecosystem services.

To learn how to make soil assessment in the field.

To carry out a profound literature review on a selected topic.

PROGRAMME :

This course will deal with different agroecological practices in cropping systems. As most of these practices are based on valorizing and optimizing ecosystem services, it will begin with an introduction to these services. Then, various lectures will deal more specifically on how ecosystem services regulate and support soil biota as well as on non-soil functional species groups including insects or plants. To deepen the knowledge gained in these lectures, a field visit and fieldwork will be carried out through soil quality assessments and the identification of beneficial soil, insect or plant biota. The field experience will be linked to different lectures about agroecological cropping practices such as intercropping, cover cropping, conservation agriculture (no tillage and permanent cover), sustainable crop rotations and biological pest control. Students will understand the role of agroecological cropping practices and learn about state of the art materials and agroecological innovations. This module is based on lectures, field visit and a seminar. For the seminar, students will conduct a literature study on topics related to the module and present their findings to colleagues and professors.

TEACHING METHODS :

Classroom lectures

Literature study

Tutorials/Instruction

Field work

Field trips

PREREQUISITES :

Basic knowledge of cropping practices.

EVALUATIONS DETAILS:

- End of module 2 : Written document (Individual, 4/7) and oral presentation (individual, 3/7) of final grade

Module 3: World agroecosystems and agricultural use *	Alexander WEZEL	Lectures	Tutorials	Practicals	Field trips	Supervised work	Evaluation	Project work
ECTS : 5		26.00 h	6.00 h	-	-	4.00 h	12.00 h	28.70 h

OBJECTIVE :

To learn about world's agroecosystems and their prevailing agricultural systems.

To make a comparative analysis about major constraints of these systems:

To learn to write an abstract.

To present an agricultural system and discuss it with other students.

PROGRAMME :

In this module, students will learn in lectures and in a seminar the basic characteristics of the world's agroecosystems (climate, soils, vegetation) and their prevailing agricultural systems. This includes the presentation of different cropping and livestock husbandry systems and their interactions in the Tropics and Subtropics, but also in Temperate and Mediterranean Europe (e.g. agropastoral land use in the Sahel, shifting cultivation and tropical forest use, rangeland systems in France). In addition a critical analysis of influencing factors such as economy, politics, land tenure or social issues will also be provided. More in-depth studies on different agronomic innovations such as agroforestry will be additionally presented. Finally, students will learn which resource conservation techniques are feasible in the different agroecosystems, but also what role indigenous knowledge of farmers plays in traditional and modern agriculture.

TEACHING METHODS :

Classroom lectures

Literature study

Tutorials/Instruction

Seminar

PREREQUISITES :

Basic knowledge about the functioning of cropping and livestock systems.

Basic knowledge about ecozones (location, climate natural vegetation).

EVALUATION DETAILS:

- Towards end of module 3 : Oral seminar presentation + written abstract (Individual) 3/5 of final grade

- End of module 3 : Oral exam (Individual) 2/5 of final grade

Module 4: Management of Agroecosystems: implications from policies and nature conservation *	Alexander WEZEL	Lectures	Tutorials	Practicals	Field trips	Supervised work	Evaluation	Project work
ECTS : 6		29.00 h	3.00 h	-	-	5.00 h	10.00 h	37.00 h

OBJECTIVE:

To learn what different types of policies or regulations are important to be taken into account for the management of agroecosystems and how they can influence the management and provide changes.

To prepare and present a poster about a selected topic.

PROGRAMME :

Management of agroecosystems is the central question for sustainable agriculture. In this module, implications from policies and nature conservation will be presented and analysed. It will be started an overview about the main present agricultural policies in Europe which are directly connected with agriculture, and how they impact on the management of agroecosystems. A special focus will be on agro-environmental measures. A second topic with lectures and discussions will be biodiversity and agrobiodiversity, and its management in agroecosystems. In a third step, different options for global agroecosystems/environmental management such as international conventions (e.g. Convention on Biological Diversity, Ramsar-Convention, Convention to Combat Desertification) and international and national attempts for nature and resource conservation will be presented. In addition, a course and an exercise on ecological corridors will be provided. Finally, students will have to use the acquired knowledge to develop a topic related to agroecosystems management, and present it in a poster session to the other students.

TEACHING METHODS :

Classroom lectures

Practical work

Literature study

Tutorials/Instruction

Poster Seminar

PREREQUISITES :

Basic knowledge of agricultural policies, agri-environmental measures, nature conservation and ecology.

EVALUATION DETAILS:

- Towards end of module 4 : Poster presentation + Poster (individual) 3/6

- End of module 4 : Oral exam (individual) 3/6

Module 5: Group project management *	Alexander WEZEL	Lectures	Tutorials	Practicals	Field trips	Supervis ed work	Evaluation	Project work
ECTS : 8		4.00 h	3.00 h	-	8.00 h	16.00 h	3.00 h	61.50 h

OBJECTIVE:

To deal with a topic in a real-life project and to respond to the demands of an external client or a research project.

To organise a group work

To self-reflect on student's on role and work in the group work.

PROGRAMME :

In this module, students will deal with different real-life projects. In groups they will analyse a demand from an external client (technical institutes, regional agricultural departments, research centres, associations, private companies) or from a research project at ISARA during the whole third semester. The objectives are to use different methodological and project management tools (defining leadership, time schedule, deliverables), and to apply disciplinary knowledge acquired in previous courses (semester 1 and 2). In addition a self-evaluation process of the students is implemented (contribution to the team work, assessment of the function in the group). The self-evaluation can be carried out either during an interview with the module coordinator or with a written document. The principle group work will be a literature review, field work or surveys in order to qualitatively and quantitatively analyse collected data, and discussion of their findings in group presentations with the external or internal clients.

TEACHING METHODS :

Group project

Literature study

Practical Training

Field work (depending on the topic of the group project)

Visit (field or institution)

Tutorials/Instruction

PREREQUISITES :

No particular pre-requisites as topics of group work vary considerably.

EVALUATION DETAILS:

Group work :

- End of semester : Written document (group) 4/8

- End of semester : Oral presentation (group) 2/8

- End of semester : Oral presentation (individual) 2/8