

Master's Degree in Agronomy and Agri-Food Specialization **AgroDesign**

*A new M2 Master curriculum at Montpellier SupAgro
For training BY research and FOR research on the
**design of productive, healthy and sustainable cropping systems
in Mediterranean and tropical regions***



Objectives

The AgroDesign M2 curriculum aims to **close the gap** between disciplines and approaches (process analysis vs. systems design) and train young scientists to design **productive, healthy and sustainable** cropping systems in Mediterranean and tropical regions in the face of **global changes** (climate, resources, biodiversity, food security...). Trainees will simultaneously learn methods and knowledge at the **scientific frontiers** of multiple disciplines (plant protection, ecology, biology, ecophysiology, genetics, agronomy) and put these to use in a **systems analysis and design** process. This “**learning by designing**” approach structures both the **generic** and **specific** components of the curriculum through applications to a range of cropping systems in Mediterranean and tropical regions.

The program is taught in English.

Employment opportunities

The target employment, after a PhD in most cases, will be in national and international research centers and universities as well as in private companies and development projects where there is increasing demand for skills in systems analysis and design in agricultural and natural resource management sectors.

Requirements

Trainees should have a M1 level with a sufficient disciplinary background (in plant protection, ecology, biology, ecophysiology, genetics, agronomy) to follow the curriculum, and a sufficient command of English to understand, read and speak in class and participate in group work (B2 level in the Common European Framework for languages or TOEIC level 750).

Coordination

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Key words

In the generic components (the conceptual and methodological core of the lectures)

Cropping systems, agrosystem, crop production, plant protection, systems analysis, systems design, crop physiology, agroecology, plant-soil-pest/disease interactions, GxExM interactions, sustainable intensification, modeling.

In the applied components (practical exercises, student projects, master these)

Mediterranean, tropical, vegetable, greenhouse, fruit trees, vineyards, arable crops, agroforestry, conservation agriculture, organic farming

Partnerships

AgroDesign is based on a strong partnership with **research groups** in its domain in Montpellier (UMR System, UMR BGPI, UMR LSTM, UMR Eco&Sols, UMR LSTM, UMR LEPSE, UMR AGAP, UMR IME, UMR CBGP, UR Hortsys, UR Aida, UR bioagresseurs), the Antilles (UR Systèmes Bananiers), La Reunion (UMR PVBMT), Avignon (UR PSH and UR PV, Sophia Antipolis : UMR ISA), Perpignan (UE Alenya) and Toulouse (UMR AGIR). Partners will provide teaching staff, case studies for the integrative module and internships for the master thesis. They will also provide a strong international network with universities in the north and south and research projects to allow for PhD grants.

Links with the **private sector** are ensured by these research groups and, for the most integrated aspects, by the AgroSYS chair of Montpellier SupAgro (joint venture with Bayer, BASF, Negoce Expansion, Advini, SCP...).

Specific partnerships will be established with French (CIRAD, INRA, IRD) institutions and international organizations (CGIAR), projects and foundations to **offer grants**, especially for students from tropical and Mediterranean countries.

Program

Module	ECTS	Coordinator	Contents (key words)
1. Case studies on integrated design of cropping systems (40 hours)	7	J. Wery C. Neema J. David	Cropping systems, agrosystem, systems design
2. Methodology for cropping systems analysis modeling and design (20 hours)	2.5	J. Wery H. Marrou	Systems, analysis, design, Crop modeling, sustainable intensification
3. Plant resistance to pests and diseases (30 hours)	4	E. Ballini J. David	Resistance genes, defence mechanisms, cultivar resistance, durability of resistance
4. Plant-soil-pathogen interactions (25 hours)	3	C. Mardsen, B. Brunel	Soil suppressiveness, rhizosphere, microbial ecology
5. Mixing plants in cropping systems (20 hours)	2.5	A. Metay	Crop association, agroecology, agro-eco system, sustainability
6. IPM for tropical crops (30 hours)	5	C. Neema S. Poussier	Epidemiologie, emerging plant diseases
7. IPM for Mediterranean crops (30 hours)	5	V. Marie-Jeanne	Biocontrol in "open" and "closed" cropping systems
8. Methodology for scientific writing and reading (15 hours)	1	J. Wery H. Marrou	Scientific writing and reading
	30		

AgroDesign is a part of Montpellier SupAgro's Master 3A programme:

<https://www.supagro.fr/web/pages/?idl=19&page=1689>