People's Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

Harmonization of Academic Master's Program Offer

Institution	Faculty / Institute	Department
University of August 20, 1955 - Skikda	Sciences	Agronomic Sciences

Field: Natural and Life Sciences
Major: Agronomic Sciences
Specialization: Plant Improvement

Academic Year: 2016-2017

1. Program overview

The Master's in Plant Breeding trains experts capable of analyzing, diagnosing, and solving challenges related to crop production, quality, and the sustainable management of agricultural systems. This program prepares future graduates to design innovative production models that integrate food, health, and environmental concerns.

The training is based on in-depth knowledge of agricultural sciences combined with advanced technical skills, such as agro-environmental diagnostics, data analysis, and the development of technical itineraries in crop production.

The primary objective is to equip students with the tools and methods necessary for crop improvement, with a strong emphasis on modern technologies and their application in real-world projects. By combining theory with practical experience, this master's program actively engages students in real agricultural management challenges, preparing them for careers in research, consulting, and innovation in agronomy.

2. Key strengths of the curriculum

The program stands out for its applied and versatile approach, providing students with training that aligns with the realities and challenges of modern agriculture. Its main strengths include:

- **Hands-on experience**: Field trips, laboratory practicals, and real-world case studies to reinforce experiential learning.
- **Integration of scientific advancements**: Up-to-date training in biotechnology and genetics for a better mastery of plant breeding techniques.
- **Versatility for diverse agricultural contexts**: Development of cross-disciplinary skills to operate effectively within various production systems.
- **Preparation for contemporary challenges**: Training in crop management and optimization to address environmental and economic issues.

This well-rounded approach ensures that students receive both theoretical and practical training, preparing them for successful careers in research, consulting, and agricultural innovation.

3. Admission information

- **Master 1:** Direct admission for holders of a Bachelor's degree in Plant Production or any other related degree in plant sciences within the Agricultural Sciences major.
- **Master 2:** Admission based on application review for students who have successfully completed the first year of the Master's in Plant Breeding.

This selection process ensures academic consistency and guarantees that students possess the necessary prerequisites for in-depth training in plant breeding.

4. Core training modules

The fundamental modules provide a solid foundation for understanding and optimizing crop management. They cover essential aspects of agronomy and plant sciences, equipping students with the knowledge and skills necessary to enhance agricultural production:

- **Fundamentals of Agronomy**: Principles of plant production and interactions between soil, plants, and climate.
- **Specialized Agriculture**: In-depth approach to strategic crops and specific production systems.
- **General Pedology**: Study of soil formation, properties, and management for sustainable production.
- **Fruit Growing and Viticulture**: Cultivation techniques, orchard and vineyard management, and crop improvement.
- **Orchard Design and Management**: Planning, establishment, and monitoring of perennial crops.
- **Plant Pathology and Crop Protection**: Disease identification, integrated pest management, and crop protection strategies.
- **Genetic Improvement and Plant Breeding**: Principles and methods of breeding for high-performance and resistant varieties.
- **Yield Optimization Techniques**: Agronomic and biotechnological approaches to maximize productivity.
- **Molecular Biology and Biotechnology**: Modern tools applied to crop improvement and protection.

These courses combine theory and practice to provide a comprehensive education, aligned with current challenges in agriculture and agronomic innovation.

5. Advanced training modules

These specialized modules allow students to deepen their expertise and explore key aspects of plant improvement, integrating innovative approaches and advanced scientific tools:

- **Bioclimatology**: Analysis of climate factors affecting crop growth and productivity.
- **Biostatistics and Agricultural Experimentation**: Data analysis methods and experimental design for optimizing agricultural practices.
- **Plant Ecology**: Study of plant-environment interactions for sustainable agricultural ecosystem management.
- **Plant Mineral Nutrition**: Understanding plant nutritional needs and strategies for optimizing fertilization.

- **Agricultural Machinery**: Use and innovation in agricultural equipment to enhance efficiency.
- **Soil-Plant Water Dynamics**: Water movement in soil and its impact on plant growth.
- **Plant and Seed Production**: Propagation techniques and certification to ensure high-quality planting material.
- **Harvesting and Storage**: Optimization of harvesting techniques and storage methods to maintain production quality.
- **Land Evaluation**: Assessment of soil agricultural potential and rational land resource management.

These advanced teachings provide a comprehensive education, combining scientific expertise with practical applications to address current challenges in agriculture and plant improvement.

6. Tuition fees: ……..

7. Language of instruction: All courses and educational activities are conducted in **French**, ensuring a thorough understanding of scientific and technical concepts in this language.

8. Curriculum structure

The program is structured over **four semesters**, combining lectures, tutorials, practical work, and field internships. The **final semester** is dedicated to an **applied research project** or a **professional internship**, allowing students to apply their knowledge in a real-world context.

Semester 1

UE	Modules	VHT	Cours	TD	TP	Autres	Coef.	Crédits
UEF 1	Fundamentals of Agronomy	67h30	3h00	1h30	/	82h30	3	6
	Specialized Agriculture	67h30	3h00	1h30	/	82h30	3	6
UEF 2	General Pedology	67h30	3h00	1h30/15d	1h30/15d	82h30	3	6
UEM 1	Biostatistics and Experimentation	45h00	1h30	1h30	/	55h00	2	4
	Bioclimatology	60h00	3h00	1h00	/	65h00	3	5
UED 1	Plant Ecology	45h00	1h30	1h30	/	5h00	2	2
UET 1	Communication	22h30	1h30	/	/	2h30	1	1

Semester 2

UE	Modules	VHT	Cours	TD	TP	Autres	Coef.	Crédits
UEF 1	Arboriculture and Viticulture	67h30	3h00	1h30	/	82h30	3	6
	Orchard Creation	67h30	3h00	1h30	/	82h30	3	6
UEF 2	Phytopathology and Crop Protection	67h30	3h00	1h30/15d	1h30/15d	82h30	3	6
UEM 1	Plant Mineral Nutrition	45h00	1h30	1h30	/	55h00	2	4
	Agricultural Machinery	60h00	3h00	1h00	/	65h00	3	5
UED 1	Water Dynamics in the Soil-Plant System	45h00	1h30	1h30	/	5h00	2	2
UET 1	Legislation	22h30	1h30	/	/	2h30	1	1

Semester 3

UE	Modules	VHT	Course	TD	TP	Others	Coef.	Credits
UEF 1	**Plant Breeding, Genetic Resources, and Variety Selection**	67h30	3h00	1h30/15d	1h30/15d	82h30	3	6
	Yield Improvement Techniques	67h30	3h00	1h30/15d	/	82h30	3	6
UEF 2	**Molecular Biology and Biotechnology**	67h30	3h00	/	1h30	82h30	3	6
UEM 1	**Seed and Plant Production**	60h00	3h00	1h00	/	65h00	3	5
	Harvesting and Storage	45h00	1h30	1h30	/	55h00	2	4
UED 1	**Land Evaluation**	45h00	1h30	1h30	/	5h00	2	2
UET 1	**Entrepreneurship**	22h30	1h30	/	/	/	1	1

Semester 4

Field: Natural and Life Sciences
Major: Agronomic Sciences
Specialization: Plant Breeding

Semester 4 is mainly dedicated to an internship in a company, which results in the writing of a final thesis and a defense.

Activity	Hourly Volume (HV)	Coefficient	Credits
Personal Work	200	4	8
Internship	175	4	7
Final Thesis	375	9	15
Seminar	-	-	-
Total Semester 4	750	17	30

Overall training summary

The following table summarizes the distribution of hourly volumes (HV) across the four semesters according to the different types of teaching units (UE).

UE	HV - Courses	HV - TD	HV - TP	Personal Work	Others (Thesis, Internship, Seminars)	Total HV	Credits	% of Credits
UEF	607h30	135h	60h	742h30	260h	1805h	54	60%
UEM	202h30	112h30	-	360h	-	675h	27	30%
UED	67h30	22h30	45h	15h	-	150h	6	6.67%
UET	67h30	-	-	7h30	-	75h	3	3.33%
Total	945h	270h	105h	1125h	260h	2705h	120	100%

Semester 4 contributes **30 credits** to the total **120 credits** required for the program.

Abbreviations:

- **UEF**: Fundamental Teaching Unit
- **UEM**: Methodological Teaching Unit
- **UED**: Discovery Teaching Unit
- **UET**: Transversal Teaching Unit