

## Genetics and Plant Breeding Program

### \* **Department Vision:**

Attaining excellence and leadership in the field of crop science and genetic improvement and establishing effective community partnerships to achieve food security and a high degree of self-sufficiency in major food crops.

### • **Department Mission:**

Qualifying highly qualified and competent professionals in crop science and genetic improvement, utilizing the department's exceptional educational programs, and disseminating applied research studies that meet the needs of the community, leading to sustainable agricultural development.

### • **Department Aims:**

The department aims to achieve the aims of the faculty and the university through the following:

- 1- Meeting the demand of high school graduates to enroll in the crop science and genetic improvement specialization, thereby increasing the faculty and university's capacity and reducing dropout rates from higher education.
- 2- Enhancing scientific research in crop science and genetic improvement and effectively contributing to solving societal and contemporary problems.
- 3- Contributing to the graduation of qualified scientific professionals with bachelor's degrees to support the agricultural and environmental sectors and meet their need for this specialization.
- 4- Establishing and fostering collaborative research and reciprocal scientific visits with local, regional, and international universities and research centers in the field of crop science and genetic improvement.
- 5- Creating and developing a stimulating learning environment that empowers students to be creative and achieve excellence, fostering their desire to pursue higher education in master's and doctoral programs.
- 6- Advancing and developing the field of crop science and genetic improvement, ensuring a promising professional future for graduates of this specialization.

### **Graduate Attributes:**

Upon successful completion of the Crop and Pasture Science program, the graduate will be able to:

- Demonstrate a thorough understanding of crop and pasture science and related disciplines.
- Demonstrate a strong desire for learning and a relentless pursuit of knowledge.
- Effectively collaborate as part of a team, carrying out assigned tasks with accuracy and integrity.
- Demonstrate originality in their work and avoid imitation.
- Calmly find solutions to problems presented to them.
- Have keen observation skills and the ability to readily identify changes.
- Possess analytical and comparative skills.
- Devise crop cultivation and pasture development plans tailored to environmental conditions and soil and water quality.
- Efficiently utilize water and soil resources.
- Cultivate crops under various production and environmental systems.
- Develop research plans, collect, and analyze data under field and practical conditions.
- Design and conduct experiments, reaching logical conclusions.
- Analyze, evaluate, and optimize agricultural natural resources and select the most suitable alternatives for their development and enhancement.

### **Potential Career Opportunities for Graduates:**

- Agricultural engineer in agricultural extension centers
- Agricultural engineer in seed multiplication institutions
- Agricultural engineer in crop production projects
- Specialist researcher in agricultural research centers
- Specialist researcher in environmental research centers
- Assistant specialist in agricultural quarantine at land, air, and sea ports
- Assistant specialist in the Standards and Quality Authority
- Specialist researcher in flour mills and grain silos companies
- Academic positions in universities after obtaining master's and doctoral degrees in this specialization

### **Program Aims:**

The program aims to achieve the aims of the department and the faculty through the following:

1. Developing student skills and competencies in devising agricultural plans that optimize genetic and environmental resource utilization under different agricultural and cropping systems.
2. Enhancing student knowledge of plant taxonomy, morphological and anatomical characteristics of field crop plants, and their relationship to environmental growth requirements and crop management practices.
3. Imparting knowledge of climatic diversity and agricultural soil classification to students to augment their production capabilities under different cropping systems and adverse environmental conditions.
4. Developing student knowledge to enhance their skills in the genetic improvement of local crop varieties using traditional practices and supportive biotechnology techniques.
5. Equipping students with the scientific foundations of genetics, plant breeding, and the concepts of modern biotechnology within the basic scientific frameworks.
6. Equipping students with practical and theoretical skills in the field of biotechnology and plant breeding.
7. Equipping students with practical skills in land preparation for cultivation and crop management practices, utilizing modern agricultural machinery and techniques under various cropping systems and environmental conditions.
8. Developing student skills and equipping them with the requisite knowledge to manage agricultural natural resources, ensuring the conservation of genetic resources, soil, and water resources for sustainable agricultural development.
9. Developing student cognitive abilities to effectively evaluate and analyze agricultural projects and natural resources, and formulate plans for their development and improvement.

## Undergraduate Program Courses for Departments of the Faculty of Agriculture, Foods, and Environment - First and Second Levels

First Level Courses					
First Semester			Second Semester		
Course code	Course Title	Credit Hours	Course code	Course Title	Credit Hours
UR001	Arabic Language (1)	2	FR001	Physics & Meteorology	3
UR006	Islamic Culture	3	FR006	Principles of Statistics	2
FR111	General Chemistry	3	FR111	Organic Chemistry	3
FR112	General Botany	3	FR112	Principles of Agricultural Economics	2
FR113	Mathematics	2	FR113	General Zoology	3
FR114	Agriculture in Yemeni Environment	1	FR114	Principles of Ecology	2
UR007	National culture	2	UR002	Arabic Language (2)	2
FR115	Geology	1	UR008	Conflict with the Israeli enemy	2
Total		17	Total		19

## Undergraduate Program Courses for Departments of the Faculty of Agriculture, Foods, and Environment - First and Second Levels

Second Level Courses					
First Semester			Second Semester		
Course code	Course Title	Credit Hours	Course code	Course Title	Credit Hours
FR211	Soil Fundamentals	2	FR221	Principles of Food Science	2
FR112	General Microbiology	3	FR222	Principles of Crops Protection	2
FR113	Biochemistry	3	UR004	English Language (2)	2
FR114	Principles of Animal Production	2	FR127	Principles of Genetics	2
UR003	English Language (1)	2	FR223	Principles of Horticulture	2
FR114	Principles of Crops Production	2	FR224	Plant Physiology	2
FR215	Principles of Agricultural Engineering	2	FR225	Principles of Human Nutrition	2
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Total		16	Total		17

**Undergraduate Courses for the Genetics and Plant Breeding Program (GEN)  
- Department of Crop Science and Genetic Improvement**

<b>Third Level Courses</b>					
<b>First Semester</b>			<b>Second Semester</b>		
<b>Course code</b>	<b>Course Title</b>	<b>Credit Hours</b>	<b>Course code</b>	<b>Course Title</b>	<b>Credit Hours</b>
CRP311	Grain and Legume Crops	3	CRP321	Industrial and Cash Crops	3
CRP312	Origin, Structure and Taxonomy of Crops	3	CRP322	Design and Analysis of Agricultural Experiments	3
CRP313	Dry Farming	3	SOL325	Fertility and Fertilization	3
CRP314	Forage and Pasture Crops	3	GEN323	Molecular Genetic	3
CRP315	Principles of Plant Breeding	3	GEN324	Quantitative & Population Genetic	3
CRP316	Crops Physiology	3	CRP324	Research Methodology	3
GEN317	Cytology Genetic	2	CRP325	Summer Training	1
<b>Total</b>		<b>20</b>	<b>Total</b>		<b>19</b>

<b>Fourth Level Courses</b>					
<b>First Semester</b>			<b>Second Semester</b>		
<b>Course code</b>	<b>Course Title</b>	<b>Credit Hours</b>	<b>Course code</b>	<b>Course Title</b>	<b>Credit Hours</b>
PLP418	Field Crops Pests	3	CRP421	Seeds Multiplication and Testing	3
PLP312	Field Crops Diseases	3	GEN422	Breeding Crops to Resist Biotic and environmental Stresses	3
GEN411	Genetic Engineering	2	CRP423	Breeding of Main Field Crops	3
GEN412	Biodiversity and Management of Genetic Resources	3	GEN424	Applications of Biotechnology on Plant Breeding	3
CRP413	Principles of Plant Biotechnology	3	CRP425	Environments and Cropping systems in Yemen	2
FR315	Agricultural Extension and Rural Community	3	CRP426	Field Training	2
			CRP427	Graduation Project	3
<b>Total</b>		<b>17</b>	<b>Total</b>		<b>19</b>

