

Irrigation Systems Engineering and Technology Program

The Irrigation Systems Engineering and Technology program teaches subjects relating to irrigation system engineering and technology. The program's goal is to teach students the fundamental concepts, sciences, and techniques involved in irrigation systems engineering and technology. The mission and objectives of the department's programs have been developed in accordance with the scientific department's vision, mission, and objectives, as well as excellence in achieving leadership and competition, and in accordance with the national vision of preparing competent graduates. It addresses job market requirements while being compatible with higher education's spirit and legislation. Similarly, the goals and objectives of the academic programs accommodated all variables and changes in a systematic, academic manner related to the planning and decision-making processes, which served as a reference when evaluating the programs' effectiveness. When designing the department's study plan, it was taken into account that the plan is closely linked to the labor market so that it qualifies the department's graduates to work efficiently and competently in meeting the needs of relevant companies and institutions, in addition to preparing the graduate to participate in scientific research and local community service or to work with various institutions.

Program Mission and Aims:

Program Mission

Offering an outstanding academic program in the fields of irrigation systems engineering, spate irrigation systems engineering, planning, design, and maintenance of modern irrigation networks, dam and well engineering, irrigation network design in greenhouses, and utilization of solar energy in water pumping. The program will be enhanced with the skills and abilities that graduates need to compete in the labor market and conduct theoretical and applied scientific research in these fields to serve the community.

Program Aims:

1. Qualifying students scientifically and practically through specialized curricula and courses.
2. Conducting numerous theoretical and applied scientific research to address and solve agricultural problems and develop agricultural practices using modern techniques in the field of irrigation systems engineering.

3. Providing consulting services to the public and private sectors.
4. Disseminating agricultural engineering knowledge and modern technologies in irrigation system design to the community.
5. Developing and nurturing critical thinking through creating a creative environment.

Graduate Attributes:

The programs are characterized by preparing competent graduates who are scientifically qualified and equipped with the engineering and technical expertise that enable them to compete in the labor market and solve agricultural problems through planning, design, and achieving sustainable development.

Program Intended Learning Outcomes (PILOs):

Upon successful completion of the program, the graduates are expected to be able to:

A. Knowledge and Understanding:

- A1. Explain the fundamentals of basic and applied sciences relevant to agricultural sciences, food, natural resources, the environment, biological systems, their significance, and conservation strategies for natural resources in the environment.
- A2. Illustrate the fundamentals of agricultural engineering, irrigation system engineering, and irrigation system technologies.
- A3. Discuss the fundamentals of irrigation system design and technologies, quality management elements, and safety in agriculture and food, including water quality for irrigation, well drilling techniques, and water harvesting.
- A4. Classify various agricultural equipment and machinery, their applications, mechanical systems, and water pumps employed in agricultural production.
- A5. Identify the fundamentals of utilizing solar energy for lifting water from wells and pumping it through networks.

B. Cognitive / Intellectual Skills:

- B1. Propose safe and quality-compliant solutions to problems related to various irrigation systems that interact with humans, plants, animals, living organisms, their functions, the interactions that occur within them, and the biological materials involved.
- B2. Develop programs for the responsible and diversified utilization of irrigation system engineering and technology, and natural resources (soil, water, air, and energy).
- B3. Select logical solutions to engineering and agricultural system problems and propose commercial production plans for crop, animal, and food products aligned with market systems.
- B4. Assess agricultural production and irrigation system problems and propose appropriate solutions.

C. Practical and Professional Skills:

C1. Design scientific experiments to solve agricultural problems by applying modern technology relevant to agricultural operations and food production.

C2. Implement agricultural facilities projects, soil surveying and reclamation, irrigation systems, water harvesting, and sustainable agricultural practices to maximize productivity and ensure food security.

C3. Apply engineering theories and techniques to irrigation system equipment and understand their operation, manufacturing, and maintenance.

C4. Efficiently utilize resources and agricultural production requirements to achieve sustainable agricultural development.

C5. Demonstrate expertise in utilizing modern technologies to design, manage, and operate irrigation systems, agricultural facilities, greenhouses, and automated service strategies.

D. General Skills:

D1. Assume responsibility for completing tasks efficiently while adhering to professional ethics.

D2. Possess the ability to manage human resources effectively and create a collaborative work environment.

D3. Proficiently communicate, prepare, and present professional reports effectively.

D4. Possess knowledge of public affairs at the national and international levels.

D5. Utilize information technology in irrigation system planning and design.

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 Irrigation Systems Engineering and
Technology Program (ETI) –
Department of Agricultural Engineering and Modern Technology**

Third Level Courses					
First Semester			Second Semester		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ETI311	Computer Application in Irrigation	3	ETI323	Engineering Hydrology	3
ENV316	Remote Sensing Techniques	3	ETI324	Engineering Principles of Irrigation	3
ETA312	Applied Mathematics	3	SOL326	Integrated Management of Water resources	2
ETA314	Engineering Mechanics	3	ETA322	Renewable Energy Engineering	3
ETA315	Surveying and Land Leveling	3	ETA323	Modern Agricultural Technology	3
SOL313	Principles of Irrigation	3	ETA326	Hydraulics	3
FR315	Agricultural Extension and Rural Community	2	ETA327	Summer Training	1
Total		20	Total		18

Fourth Level Courses					
First Semester			Second Semester		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ETI411	Hydraulics of Pumps and Open Channels	3	ETI414	Engineering Techniques of Hydroponics	3
SOL415	Spate (Sail) irrigation	3	ETI421	Water Treatment Engineering	3
ETI413	Irrigation Systems Engineering (1)	3	ETI422	Dams and Wells Engineering	3
ETI414	Management, Operation, and Maintenance of Irrigation Systems	3	ETI423	irrigation Systems Engineering (2)	3
ETI414	Irrigation Techniques in Greenhouses	3	SOL424	Water Harvesting Techniques	3
CRP318	General Crops Production	2	ETA425	Design and Evaluation of Modern Irrigation Systems	3
CRP322	Design and Analysis of Agricultural Experiments	3	ETA426	Research Project	2
Total		20	Total		20