

Department of Agricultural Engineering
College of Agriculture
King Saud University

Graduate Program in Agricultural Engineering

M.Sc in Agricultural Engineering

Introduction: The M.Sc program in Agricultural Engineering is offered to qualified students with a B.Sc degree in Agricultural Engineering or a related field, to strengthen their scientific abilities and advance their academic levels in one of its four major areas of specializations, namely, Power and Machinery Engineering, Irrigation and Drainage Engineering, Food Process Engineering, and Environment and Agricultural Structures Engineering. The program achieves its objectives through advanced courses emphasizing theoretical and applied engineering tools and methods devoted to specialized technical topics covering production and processing aspects of various agricultural and biological sectors. The student complement his acquired abilities gained through successful completion of the required course work by submitting a thesis covering an important topic in his area of specialization.

Teaching and research facilities in the Agricultural Engineering Department include a diversified set of modern and valuable instruments, operations, processing, and simulation equipment, and pilot scale facilities, in addition to a well equipped laboratory of personal computers and related accessories, a well equipped mechanical and wood works workshop, an educational farm, in addition to the main College farm in Dirab.

Program Objectives

The M.Sc Program is intended to achieve the following major objectives:

1-Academic preparation of graduate students in their respective major areas of specialization in the field of Agricultural Engineering, namely, Power and Machinery Engineering, Irrigation and Drainage Engineering, Food Process Engineering, and Environment and Agricultural Structures Engineering.

2- Enrichment of students scientific abilities through specialized courses in mathematical, engineering, physical, and biological sciences, with the specific aim of qualifying them to an advanced and efficient ability level in handling scientific and technical information and knowledge resources available in their respective areas of specialization.

3. Development of scientific and research abilities of students to design and carry out research devoted to application of engineering principles to solve problems in agricultural and biological systems.

4-Qualify students to handle real life engineering and technical problems in the production and processing sectors of the agricultural and biological fields.

Areas of Specialization

The program allows students to specialize in one of the following four areas of specialization:

- 1- Power and Machinery Engineering
- 2- Irrigation and drainage Engineering
- 3- Food Process Engineering
- 4- Environment and Agricultural Structures Engineering.

Admission Requirements

Candidates should fulfill requirements of the unified guidelines for graduate studies in Saudi Universities.

Program of Study and the M.Sc Degree Requirements

A- Enrolled students should successfully complete at least (24) credit hours from a package of specified courses as follows:

1- Successful completion of at least (6) credit hours from the package of common general courses offered for all areas of specialization.

2- Successful completion of at least (18) credit hours from the specialized courses of the respective area of specialization.

B- Submission of a M.Sc thesis in the area of specialization.

Study Plan

The study plan is comprised of the following:

First: Successful completion of at least (6) credit hours from the package of common general courses offered for all areas of specialization.

Common General Courses Offered for all Areas of Specialization

Course Credit Designation	Course name	Hours
Math 501 3	Special Functions and Integral Equations	
Math 506 3	Ordinary and Partial Differential Equations	
Math 508 3	Numerical Methods for Differential Equations	
GE 501 3	Computer Simulation of Engineering Systems	
AGEC 512 AGEC 518 3	Advanced Agricultural Statistics (1) Design and Analysis of Agricultural Experiments	3

Second: Study of at least (18) credit hours from specialization area courses.

A- Power and Machinery Engineering

Course Credit Designation	Course name	Hours
AGEN 510 3	Analysis of Agricultural Machinery Systems	
AGEN 511 3	Harvesting Machines	
AGEN 512 3	Advanced Agricultural Tractor	
AGEN 513 AGEN 580 3	Soil-Implement Relationship Selected Topics in Agricultural Engineering	3
AGEN 585 3	Measurements and Estimation in Biological Control	

AGEC 502	Systems	3
MFE 544	Farm Management	3
ME 576	Human Factors Engineering	3
3	Advanced Energy Conversion	

B- Irrigation and Drainage Engineering

Course Credit Designation	Course name	Hours
AGEN 520	Advanced Agricultural Drainage	3
AGEN 521	Advanced Sprinkler and Drip Irrigation	
3		
AGEN 522	Advanced Surface Irrigation	3
AGEN 523	Management, Conservation, and Distribution of Farm Irrigation Water	3
AGEN 580	Selected Topics in Agricultural Engineering	
3		
CE 505	Hydraulics	3
CE 522	Subsurface Water Hydrology	
3		
CE 527	Planning Water Resources	
3		
SS 561	Advanced Soil Physics	3

C- Food Process Engineering

Course Credit Designation	Course name	Hours
AGEN 530	Thermal Process Design of Food	
3		

AGEN 531 3	Unit Operations in Food Process Engineering
AGEN 532 3	Conditioning and Storage of Cereal Grains
AGEN 545 3	Engineering Properties of Agricultural Materials
AGEN 580 3	Selected Topics in Agricultural Engineering
AGEN 585 3	Measurements and Estimation in Biological Control Systems
CHE 512 3	Advanced Studies in Heat Transfer
FSN 538 3	Product Development and Sensory Evaluation of Food
AGEC 516 3	Economics of Food Industries

D- Environment and Agricultural Structures Engineering

Course Credit Designation	Course name	Hours
AGEN 532 3	Conditioning and Storage of Cereal Grains	
AGEN 540 AGEN 543 3	Engineering of Animal Environment Advanced Greenhouses Engineering	3
AGEN 545 3	Engineering Properties of Agricultural Materials	
AGEN 580 3	Selected Topics in Agricultural Engineering	
AGEN 585 3	Measurements and Estimation in Biological Control Systems	
PLP 531 3	Vegetable Products Environment	
ANP 565	Advanced Dairy Cattle	3
ANP 568	Poultry Industry	3
ME 574 3	Advanced Radiation Heat Transfer	

Third: M. Sc Thesis

AGEN 600

Thesis