האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

BASIC IRRIGATION SYSTEMS - 73912

Last update 04-08-2022

HU Credits: 3

Degree/Cycle: 2nd degree (Master)

Responsible Department: Field and Vegetable Crops-International Prog.

Academic year: 0

Semester: 1st Semester

Teaching Languages: English

Campus: Rehovot

Course/Module Coordinator: Dr. Mollie Sacks

Coordinator Email: irrigation1011@gmail.com

Coordinator Office Hours: by appointment

Teaching Staff:

Dr. Efraim Tripler

Course/Module description:

The course is designed to provide basic concepts and methods required for understanding modern approaches to irrigation. The course work requires weekly readings of journal papers, concluding with designing pressurized irrigation systems for an agricultural field.

Course/Module aims:

To provide a comprehensive understanding of pressurized irrigation systems versus rainfall and open channel irrigation on crop growth, water use efficiency, environmental protection and yields.

Learning outcomes - On successful completion of this module, students should be able to:

Have a greater appreciation of soils and their role in sustaining life.
Know and understand the basic soil properties pertaining to water availability to plants.
Know and understand the concept of water use efficiency for high crop production.
Determine how much and when to irrigate by integrating the understanding of soil, water, plant and atmospheric conditions.
Comprehend the principles of pressurized irrigation systems.
Design and compare a basic drip irrigation system to a sprinkler irrigation system.

Attendance requirements(%):

100

Teaching arrangement and method of instruction: Lectures, Student led discussions of journal papers, Field trips and field exercises, written reports of exercises.

Course/Module Content:

Agriculture, water use efficiency and production;
Soil-water relationships;
Water availability to plants;
Determining water requirements;
Irrigation scheduling;
Pressurized vs. non pressurized irrigation systems;
Sprinkle and drip;
Sprinkler irrigation: principles, design, evaluation and management;

Drip irrigation: principles, field design, surface and subsurface application, management;
Current topics in irrigation: automation, fertigation, filtration, recycled water, salinity and drainage.

Required Reading:

1. Hillel D., 2011, An Overview of Soil and Water Management: The Challenge of Enhancing Productivity and Sustainability, Soil Management: Building a Stable Base for Agriculture, J. L. Hatfield and T. J. Sauer (ed.), American Society of Agronomy and Soil Science Society of America, p. 3-11.
2. M.B. Kirkham, 2011, Water Dynamics in Soils, J. L. Hatfield and T. J. Sauer (ed.), American Society of Agronomy and Soil Science Society of America, p. 53-65.
3. Schneider C. 2014, From Pores to Pipes: The Problem of Underground Erosion in Soils, Soil Horizons, Soil Science Society of America, Oct. p.1-3.
4. Martin Smith, Giovanni Muñoz and Javier Sanz Alvarez, 2014, Irrigation Techniques for Small-scale Farmers: Key Practices for DRR Implementers, FAO.
5. S. Assouline and M. Ben-Hur, 2003, Effects of Water Applications and Soil Tillage on Water and Salt Distribution in a Vertisol, Soil Sci. Soc. Am. J. 67:852–858.
6. : C.C. Shock, A.B. Pereira, B.R. Hanson and M.D. Cahn. 2007, Vegetable Irrigation, Irrigation of Agricultural Crops. p.535-606.
7. Sacks M. and Bernstein N., 2011, Utilization of reclaimed wastewater for irrigation of field-grown melons by surface and subsurface drip irrigation, IJPS.59.2-4.159.

Additional Reading Material:

Soil Physics: A Review with Applications

Course/Module evaluation:

End of year written/oral examination 0 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 60 %
Assignments 0 %
Reports 30 %
Research project 0 %
Quizzes 10 %
Other 0 %

Additional information:

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