

The Hebrew University of Jerusalem

Syllabus

FUNDAMENTALS OF AGRICULTURAL METEOROLOGY - 71619

Last update 23-02-2016

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: soil and water sciences

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: Rehovot

Course/Module Coordinator: Dr. Eran Tas

Coordinator Email: Eran.Tas@mail.huji.ac.il

Coordinator Office Hours: Wednesday 15:00-17:00

Teaching Staff:

Dr. Eran Tas
Ms. Maor Gabay

Course/Module description:

Elements of weather and climate: Solar energy and its distribution over the earth. Temperature of the atmosphere, heating and cooling of land and water surfaces. Pressure as a climate element; types of pressure systems and their origins; distribution of pressure and the general circulation of moisture, evaporation and condensation; dew and dew formation; clouds and precipitation. Air masses and fronts; cold and warm fronts. Classification of climates (tropical climates, dry climates, polar climates and mountain climates): The climate of Israel, and its effects on siting of various crops. Thermodynamics of the atmosphere. Types of frost (radiative frost, advective frost). Frost protection and frost prediction. Agrotopoclimatology surveys for low temperatures.

Course/Module aims:

- Understanding the processes that connect the atmosphere, soil and vegetation
- Imparting theoretical and practical tools

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

Describe the sequence Soil - plant - atmosphere in terms of the effect of meteorological conditions on evaporation and transpiration and transition of materials between the surface and the atmosphere.
Describe basic processes in the atmosphere near the ground

Attendance requirements(%):

0

Teaching arrangement and method of instruction: Lectures

Course/Module Content:

Thermodynamics of dry and humid air - the first law, energy conservation, temperature, dew temperature, wet bulb temperature, water vapor pressure, relative humidity and specific humidity.

Laminar and turbulent flow - wind

Heat and mass transfers - heating and cooling processes of objects (land, water, vegetation) and the atmosphere and the relationship.

Composition of the atmosphere - the forces operating in the atmosphere and the movements derived from them, atmospheric layer, wind, wind shear and turbulence, boundary layer, atmospheric stability and instability and their establishing parametrics, a-diabetic processes, buoyancy, vertical profiles. Processes of radiation and radiation balance sheet. Water evaporation from herbal systems and water bodies. Effect of chemical factors on soil and vegetation. Chemical processes related to the continuity of atmosphere, soil and vegetation. Measurements and modeling different scales of floods.

Required Reading:

none

Additional Reading Material:

Campbell, G.S. and J. M. Norman, 1998. An introduction to Environmental Biophysics. Second edition. Springer. Chapters 10, 11 and 15. Pdf file on course website.

•2. FAO 56 - Crop Evapotranspiration

(Food and Agriculture Organization)

<http://www.kimberly.uidaho.edu/ref-et/fao56.pdf>

•3. Baldocchi, D. Biometeorology course:

•From website:

<http://nature.berkeley.edu/biometlab/espm129/>

Course/Module evaluation:

End of year written/oral examination 80 %

Presentation 0 %

Participation in Tutorials 0 %

Project work 0 %

Assignments 10 %

Reports 0 %

Research project 0 %

Quizzes 10 %

Other 0 %

Additional information:

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