The Hebrew University of Jerusalem

Syllabus

ISRAEL WATER RESOURCES AND THEIR MANAGMENT - 71625

Last update 04-11-2024

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Soil and Water Sciences

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Rehovot

Course/Module Coordinator: Daniel Kortzman

Coordinator Email: daniel@volcani.agri.gov.il

Coordinator Office Hours: By appointment

Teaching Staff:
Dr. Daniel Kurtzman,
Ms. maya weinstein

Course/Module description:
Precipitation,evapotranspiration,runoff,infiltration,and groundwater flow processes - principles and their application in Israel: artificial precipitation,evapotranspiration - reduction techniques,runoff in Israel wad is,drainage and storage of surface water,the national carrier,artificial recharge of surface and waste water,the major aquifers of Israel,salinization and contamination of precipitation,surface and ground water. The coastal and mountain aquifers. The Sea of Galilee and its operation. Water in the Negiv Desert and the Arava Valley. Water management in Israel.

Course/Module aims:
To learn about the water situation in Israel. To Describe the water sources and to learn about ways to increase them. To visit sites associated with Israel's water sources

Learning outcomes - On successful completion of this module, students should be able to:
To evaluate the water sources in Israel and their impact on agriculture, industry and households

Attendance requirements(%):
100

Teaching arrangement and method of instruction: Lectures, exercises and tours

Course/Module Content:
1. introduction- the israeli coping methods with water limited resources- stable water resource vr.the controversial raining rate. israeli law of water, water recycling manipulations of high quiality water,the use of low quiality water, creating high quiality water from salty solid resource.
2.1 Natural water cycle: precipitation - formation, measurement and assessment sediments precipitations in Israel - distribution, strengths, increasing artificial rain. Evaporation (calculated tub)Israel growth promoters.
3.The natural water cycle: surface runoff, surface runoff in Israel Loss to the sea, factories for preserving perception flood in Israel. Permeation - General view under different land use in Israel. Unsaturated core processes affecting water enrichment,

groundwater, hydraulic estimatiom and Flow through saturatedt transmission medium.
4.Sea of Galilee-Drainage basin, water balance, General water quality indices, the salinity of the Sea of Galilee and its impact on the water sector,other problems of water quality in Sea of Galilee, the Sea of Galilee and the National Water Carrier.
5.Coastal Aquifer - free Aquifer - influences of production and water quality, water balance, processes of salinization(seawater infiltration and aquifer salinization), other water quality problems (nitrates, industrial pollution).
6.Mountain aquifer: confined aquifer - influences on production and water quality, flow cracks, rocks and karst Karbonteim, Yarqon crocodiles basin Current status and history, the eastern area of Nablus Basin in thr Gilboa.
7.Small aquifers system in the Negev and Arava, the Eocenic aquitard in the northern Negev and location of the Industrial Zone in Ramat Hovav - Perspective decades after. Brief overview of the rest of the small aquifers - Carmel, Western Galilee, Golan. Hydrological data are available online.
8.Consumers and potable water sources
distribution of Israeli water consuming sectors, brackish water for agriculture in Israel, using drain water in agriculture, desalination of brackish water in Israel, wastewater reuse in agriculture, wastewater in Israel (industrial and domestic) quantities, sewage problems and how to handle it, wastewater quality measures.
9.from sewage to treated waste water and reclaimed water. pre-treatment,primary precipitation, secondary biological treatment, activated sludge, nitrification, denitrification, secondary precipitation,
sludge - spining and handaling. the use of sluge in agriculture, advanced treatment (tetriary..)
treated waste water- reservoir, disposal regulations, W.W.T.P.
10.Seawater desalination-
Desalination methods, distillation, multi-stage distillation, membrane methods, diffusion and osmosis, reverse osmosis membranes. Structure of the water desalination reverse osmosis device - Pre treatments - Disposal of brine, complementary treatments
11.Desalinated seawater in Israel. Energy prices, environmental issues, water crises and government decisions on targets desalination plants - Ashkelon, Palmachim, Hadera, Ashdod and Soreq.
12.water transportation from source to consumer by the National Water Carrier of Israel. National Carrier (Kineret - Rosh Haain) Sapir and Eshkol cites, the first line to the negev(nir-am), jerusalem water system, the current challenge -transportation of desalinated water, future plans, local systems, water corporations, the price of water. The third line W.W.T.P and other systems of wastewater trasportation.
13.People from the water industry talk about their organization and activities: 2-3 lectures of guest speakers from the Water Authorities, Mekorot, Tahal organization and other companies operating in the water sector in Israel.

<u>Required Reading:</u>

None

Additional Reading Material:

None

Grading Scheme:

Additional information:

None