The Hebrew University of Jerusalem

Syllabus

Water and Environment - 73908

Last update 10-12-2024

HU Credits: 3

Degree/Cycle: 2nd degree (Master)

Responsible Department: Environmental Quality Sciences

Academic year: 0

Semester: 1st Semester

Teaching Languages: English

Campus: Rehovot

Course/Module Coordinator: Dr. Harel Gal

Coordinator Email: harel.gal@mail.huji.ac.il

Coordinator Office Hours: By appointment (T:0544464015)

Teaching Staff:

Mr. gal Harel

Course/Module description:

Studying the processes of percolation, flow and transport of solutes and pollutants in groundwater, various causes of groundwater pollution and the ways to treat them. Water treatment and wastewater treatment and effluent reuse

Course/Module aims:

To provide the student with knowledge about the causes of water pollution and water treatment processes and the remediation of water sources as well as about waste water treatment and reuse of sewage

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

On successful completion of this course the student should be able to understand:
a. The nature of impurities in waters and wastewaters.
b. The basic principles of conventional and advanced treatment processes in water and wastewater treatment and reuse.
c. Select appropriate processes depending on the nature of impurities to be removed and the intended use of the treated water or effluent.

Attendance requirements(%):

At least 80-90% of the time. Full attendance required for the technical visits day

Teaching arrangement and method of instruction: Frontal teaching by presentations which will be previously posted in the course web site.

Course/Module Content:

DETAILED COURSE PROGRAM • Opening and introduction - the global and local water crisis, problems in water supply and lack of available water
• Natural water sources (groundwater, surface water), groundwater hydrology, enrichment and production
• The water sector in Israel, regulation, laws, regulations and management of the water sector. Water quality parameters
• Possible sources of water pollution - industry, agricultural sources etc.
• Monitoring and control of groundwater and surface water - goals and types of monitoring and control, monitoring and sampling methods.
• Remediation of water sources - regulation, the polluter pays principle, setting target values for restoration, impact on various receptors.

• Remediation and treatment of contaminated water sources - methods for in-situ treatment, ex-situ treatment methods, containment and hydrological confinement. Considerations for choosing rehabilitation and treatment methods.
• Water treatment for drinking water supply:
o Treatment methods for the different pollutants, application and treatment costs.
o Sea water desalination.
• Wastewater treatment - regulation, treatment methods in wastewater treatment plants (WWTPs). Secondary, tertiary and quaternary treatment.
• Effluents reclamation - the importance of reclamation, irrigation methods, regulation and impact on the environment, soil and public health. Monitoring micropollutants in wastewater and sewage.

Required Reading:
Presentations posted on the web site.

Additional Reading Material:

Grading Scheme:
Written Exam % 70
Essay / Project / Final Assignment / Home Exam / Referat 30 %

Additional information: