האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Measurement and mapping - 55012

Last update 20-09-2023

HU Credits: *3*

Degree/Cycle: *2nd degree (Master)*

Responsible Department: *Business Administration*

Academic year: *0*

Semester: *1st Semester*

Teaching Languages: *Hebrew*

Campus: *Mt. Scopus*

Course/Module Coordinator: *Mr. Hagay Leibushor*

Coordinator Email: *hagay.leibushor@mail.huji.ac.il*

Coordinator Office Hours:

Teaching Staff:

Mr. Hagay Leibushor

Course/Module description:

The course deals with knowing the main concepts from the world of geodesy, geodetic projections, and coordinate systems. Studying and reading different types of maps, and their use for an appraiser. Learning the principles of measurement, types of networks, basic calculations, and knowing measuring devices. Basics and principles in photogrammetric mapping. Studying and studying the constitutional basis of the world of measurements and mapping, chapters of the Measurements Ordinance, the Measurement Regulations (Measurement Profession) 1982, the Measurement Regulations (Measurements and Mapping) 2016, and the Planning and Construction Law, 1965

Course/Module aims:

Acquiring basic knowledge in the field of measurement and mapping, while knowing key concepts, learning basic calculation techniques, and studying the constitutional basis of the world of measurements and cadastre.

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

The students will know and be able to read a map, and extract basic information from it.
The students will experiment and be able to solve basic calculation problems from the surveyor's world.
The students will get to know and experience retrieving information from online sites.
The students knew how to distinguish between the bodies operating in the cadastre world, and to identify the role and activity of each body

Attendance requirements(%):

Teaching arrangement and method of instruction:

Course/Module Content:

Basic concepts
The Earth (its shape, size, properties, movements, magnetic field). Geometric and physical models of KHA. The role of geodetic levies. Levies used in Israel. The basic principles of geodetic coordinate systems (planar, spatial, geographic).

Reminder of angle calculations, degrees minutes seconds, transitions and trigonometry.
Basic concepts
The basic principles of geodetic control networks in Israel (horizontal, vertical, spatial) and their ratings. Israel networks (the old Israel network, the new Israel network, Israel 2005 network, Israel attack network). North directions (geographic, magnetic, grid north).
Shared online experience in the GOVMAP and GOOGLE-EARTH system
Measurements and results processing
The principles of measurement, devices for measuring distances (electromagnetic rangefinders, sights, horizontal and vertical angles, height differences STATION TOTAL), balance), and spatial vectors, GPS
Measurements and results processing
Basics of error theory. Estimating the accuracy of the measurement and its meaning. error propagation. Basics of measurement and calculation of a horizontal control network; Triangulation, triliteration, polygons.
Measurements and results processing
The principle of basic calculations in plane coordinate systems (distances, azimuths, areas)
Experience and examples.
Measurements and results processing
Measurement and calculation of height differences and heights. The difference between orthometric height and ellipsoidal height. Principles of volume calculation.
Maps and their use
printed or drawn maps; Numerical (digital) maps. Map scale. Types of maps in use in Israel: topographic maps, cadastral maps (such as Gush maps, Gush Shuma maps, plans for registration purposes, subdivision plans), engineering maps, city maps, thematic maps, nautical charts; The typical scales for all the above types of maps.
Getting to know Mapi's online sample maps.
Maps and their use
Reading maps in different KNM: orientation, determining distances, directions, angles, areas. Reading heights with the help of elevation lines and topographic fault lines. Working with maps of different scales. Description of points, plots, buildings, etc. in KNM defined in a coordinate system .
Delving into an example map for a building permit of Mapi, and the possibilities of receiving the data from the map.
Maps and their use
Transferring distances and areas from map to map. Determining gradients, checking lines of sight and dead areas.
Exploring a topographic map for example.
Mapping (traditional and computerized) and geographic information systems (GIS)
The purpose of the mapping. Mapping methods: the smearing method; Polar mapping. Photogrammetric mapping: principles and basics of photogrammetry; Aerial view; Aerial photograph (TAA) analog and digital; distortions and close-up aerial view of the TAA.

Uses of outputs; reconstruction of a three-dimensional model of reality for the purpose of mapping. The photogrammetric mapping method. The essence and purpose of the geographic information system (GIS), the uses of GIS from the appraiser's point of view.
Cadastral measurements and mapping, registration of rights in real estate
The history of the cadastre in Israel. History of registration of rights in land in Israel from the Ottoman period, through the period of the British Mandate and in the State of Israel until today. The principles of land settlement (Torrance principles). The process of settlement and cadastral mapping. Registration block maps. permutations in the arrangement. Plans for registration purposes (the tchar). The meaning of the tchar in the area designated for first registration, and its meaning in the regulated area.
An example case study of a first registration.
Cadastral measurements and mapping, registration of rights in real estate
Measurement and cadastral mapping in an unregulated area; The three-dimensional cadastre in Israel - three-dimensional property registration; "Detailed plan" - as defined in point D in Chapter III of the Planning and Construction Law; Partition maps, and their meaning from the point of view of TBA; the essence of the analytical division. The order of registration operations. A plan for documenting borders (2013) and its meaning.
Cadastral measurements and mapping, registration of rights in real estate
General information about laws and regulations relevant to the Israeli cadastre [from the following legislation: The Lands Ordinance (Arrangement of Property Rights) - May 30, 1928 (Chapter 5, the following Ordinance to order the matter of property rights in land and registration of property rights arrangements), Survey Ordinance - 1929, Chapter IX Title C of the Land Law, 5779 - 1969 and Chapter III, Title VIII of the Land Regulations (Management and Registration) 5772 2011, Ordinance on the Settlement of Rights in Real Estate [new version], 5779-1969, Surveyors Regulations (the surveying profession) , 1982 - 5742]. Selected chapters from the surveying regulations (surveying and mapping), 2016 - 2016, Chapter 4 (Measuring and editing of 2010 and 2013). Registration of rights in real estate in the State of Israel. The roles and powers of the various bodies in the registration The rights and management of real estate. Knowledge of registration forms. Registration of condominiums, public housing and agricultural plots.

Required Reading:
The lecture slides that will be uploaded on the course website

Additional Reading Material:

Grading Scheme:

Written / Oral / Practical Exam 90 %
Essay / Project / Final Assignment / Home Exam / Referat 10 %

Additional information: