

Ministry of Higher Education and Scientific research



Department of Soil and Water Sciences

College of Agricultural Engineering sciences

University of Salahaddin-Erbil

Subject: Soil Engineering

Course Book – *For* (3rd year students)

Lecturer's name: Prof. Dr. Akram Othman Esmail

B.Sc. 1980 University of Sulaimani

MSc. 1986 University of Salahaddin

PhD. 1992 University of Baghdad

and

Assist. Lect. Haval Haji Yousif

BSc. 2013, in Soil and water/ University of Salahaddin-Erbil

MSc. 2020, in Soil Engineering/ Soil and Water/ University of Salahaddin-Erbil

Academic Year: (2022-2023)

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Course Book

1. Course name	Spring semester 2022-2023
2. Lecturer in charge	Prof. Dr.Akram Othman Esmail
3. Department/ College	Soil and Water Sciences, Agricultural Engineering sciences.
4. Contact	e-mail: akram.esmail@su.edu.krd Tel: 07504672975
5. Time (in hours) per week	Theory: 2 hours per week Practical: 3 hours per week
6. Office hours	6 hours/week
7. Course code	
8. Teacher's academic profile	<p>The main points in my academic profile can be summarize as follow:</p> <ol style="list-style-type: none">1- Teaching B.Sc. M.Sc. and PhD students.2- Doing scientific researches.3- Member of some scientific committees in the soil and water department and college of Agriculture.4- Supervising (13) Ph.D. students and 28 MSc. students.5- Contributing in scientific conferences.6- More than 300 examine committee for MSc and Ph.D. students either as a member or chairman.6-Evaluation of numerous researches for scientific journals in Kurdistan, Iraqi and international journals.8-Doing statistical analysis for numerous post graduate students.9-Teaching students in other Universities.
	<p>2. Lecturer in charge: Assist. Lect. Haval Haji Yousif</p> <p>3. Department/ College, Soil and water/ College of Agricultural Engineering sciences</p> <p>4. BSc. 2013, in Soil and water/ College of Agricultural Engineering sciences</p> <p>MSc. 2020, in Soil Engineering/ Soil and water/ College of Agricultural Engineering sciences / Salahaddin Univ</p> <p>5. Contact e-mail: haval.yousif@su.edu.krd</p>

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	<p>Tel: (0750 493 7535)</p> <p>6. Time (in hours) per week Practical: 2h. (35) Marks.</p> <p>7. Office hours (6)h//week</p> <p>8. Course code</p>
9-Keywords	<p>Soil definitions in different sciences, uses of soil in engineering, main soil properties in soil engineering. Earthworks, Soil volume change, Soil swelling and shrinkage and Soil geotechnical properties,</p>
<p>10-Soil is so important material and source for life that we cannot imagine life without it. The soil has different meanings depending on branch of science for example the use of soil in engineering science is differing from agricultural sciences. The soils very important in soil mechanic and civil engineering. It is also a type of natural resource and has different applications.</p>	
<p>11. Course objective: Goals of the course or Goals of studying Soil Engineering:</p> <p>1-Introduce the students with the essential concepts of the engineering properties of soils in soil engineering in additional to the definition of soil in different sciences.</p> <p>2. Understanding of soils as engineering materials and its uses.</p> <p>3. Studying the engineering properties of soils.</p> <p>4. Helping the students to be familiar with the soil sampling, soil testing and site investigation.</p> <p>5- The differing between soil in engineering and agricultural sciences.</p>	
<p>12. Student's obligation: The student must have an important role:</p> <p>1- The students must contribute in the scientific discussions in the class or teaching hall.</p> <p>2- The students must know the importance of quizzes, homework, reports and exams.</p> <p>3- It is necessary to contribute the student in presentation a scientific subject.</p>	
<p>13. Forms of teaching: There are different forms of teaching:</p> <p>1-Datashow and power point.</p>	

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<p>2- White board. 3-Lectures.</p>	
<p>14. Assessment scheme Breakdown of overall assessment and examination: 1-Monthly exam 9 marks. 2-Quizzes 2 marks. 3-Present and contributing in scientific discussions 2 marks. 4-Seminar 2 marks.</p>	
<p>15. Student learning outcome: Explaining and training on determining soil engineering properties, and their Applications in civil and irrigation and drainage projects.</p>	
<p>16. Course Reading List and References: 1-Al-Waily, M.J. (2018) Fundamentals of soil mechanics and its engineering application. Baghdad, Iraq. 2- Arthur, E., Schj�ning, P., Moldrup, P., and de Jonge, L. W. (2012). Soil Resistance and Resilience to Mechanical Stresses for Three Differently Managed sandy Loam Soils. Geoderma 173-174, 50–60. doi:10.1016/j.geoderma.2012.01.007 3 - Balasubramanian, A. (2017) Engineering properties of soils. University of Mysore, Mysore 4-Chen ,F.H. and Morris,M.D. (2000) Soil engineering testing , design , and remediation. USA</p>	
17. The Topics:	Lecturer's name
1- Introduction: Which includes definition of natural soil in soil engineering and other sciences, history of soil engineering.	Dr.Akram Othman Esmail 1 st week or meeting (2) h.
1- Introduction about soil engineering properties and how to work in the Lab. and Field site for (Engineering projects) - In the Field taking Soil sampling.	Assist. Lect. Hval Haji Yousif 1st week or meeting (2) h.
2-Importance of Soil Engineering and purposes of geotechnical engineering.	Dr.Akram Othman

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<p>2- In the Field take:</p> <ul style="list-style-type: none"> - Insitu-density by core and SPT method, - loose density excavated density, - In the lab. Determination Soil Moisture content. 	<p>2nd meeting (2) h.</p> <p>Assist. Lect. Hval H. Yousif (2) h.</p>
<p>3-The problems of soil engineering.</p> <p>3- Visiting to Mirawa Tunnel in the Shaqlawa District.</p>	<p>Dr.Akram Othman Esmail 3rd week (2) h.</p> <p>Assist. Lect. Haval H. Yousif (2) h</p>
<p>4-The main soil engineering properties.</p> <p>4- Sieving analysis, Particle Size Analysis</p>	<p>Dr.Akram Othman Esmail 4th meeting (2) h.</p> <p>Assist. Lect. Haval H. Yousif (2) h</p>
<p>5- Identification, Description and Classifications of soil for engineering and agricultural purpose</p> <p>6-Determination Atterberg's limits (L.L., P.L., and P.I.) by Casa Grande device and soil shrinkage limit, Specific gravity, Fine Aggregates and Fine-Grained Soils</p>	<p>. Dr. Akram Othman Esmail 5th and 6th meeting (4) h</p> <p>Assist. Lect. Haval H. Yousif (2) h</p>
<p style="text-align: center;">5- First examination.</p>	<p style="text-align: center;">(1) h.</p>
<p>7- Comparison between systems of soil engineering classification First examination.</p> <p>8-Visiting to Duhok university for doing some analysis and visiting Dohuk Dam.</p>	<p>Dr. Akram Othman Esmial 7th meeting (2) h.</p> <p>Assist.lect. Haval H. Yousif</p>

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<p>9- Engineering properties of Gravels, sand, silt, organic matter and clay.</p> <p>8- Laboratory Measurement of Optimum Moisture Content (OMC) and Maximum Dry Density (MDD)</p>	<p>Dr. Akram Othman Esmail 8th (2) h.</p> <p>Assist. Lect. Haval H. Yousif (3) h</p>
<p>9 and 10 - Role of soil and clay minerals in limiting soil engineering properties in irrigation projects and buildings.</p> <p>10- (Compaction Test) by Sand cone method, and Nuclear Method (compacted density).</p> <p>and 10- Visiting to Hawler construction Laboratory</p>	<p>Dr.Akram Othman 9th and 10th meeting (4) h.</p> <p>Assist. Lect. Haval H. Yousif (2) h</p> <p>Assist. Lect. Haval H. Yousif (2) h</p>
<p>11-and 12 - General comparison between soil in uses engineering science and agricultural science.</p> <p>11-Soil swelling and shrinkage</p> <p>and 12. Los Angeles abrasion test and California Bearing Ratio (CBR) Measurement test.</p>	<p>Dr.Akram Othman Esmail 11th and 12th meeting (4) h.</p> <p>Assist. Lect. Haval H. Yousif (2) h</p> <p>Assist. Lect. Haval H. Yousif (2) h</p>
<p>13- Soil Chemical Analysis (Calcium Carbonate)</p>	<p>Assist. Lect. Haval H. Yousif (2) h</p>
<p>14- Visiting to Duhok City or 150m. project in the Erbil City</p>	<p>Assist. Lect. Haval H. Yousif (2) h</p>
<p>15- Second examination.</p>	<p>(1)h.</p>

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18 Extra notes:

Nothing

1. Peer review: Approved by Assist. Prof. Dr. Abdulrahman Pirdawd Haider.