

COURSE Syllabus

**Course Name: Wastewater Engineering
Laboratory**

Course Number : 04034172

General Information and Course Details:

Course title	Wastewater Engineering Laboratory
Course number	04034172
Credit hours (theory, practical)	3 credit hours (practical)
Contact hours (theory, practical)	3 hours (practical)
Prerequisites/corequisites	Water Treatment (1) [04034171]
Program title	Civil Engineering
Program code	03
Awarding institution	Isra University
Faculty	Faculty of Engineering
Department	Civil Engineering
Level of course	Fourth year
Year of study and semester (s)	2020/2021, First semester
Final Qualification	B.Sc
Other department(s) involved in teaching the course	
Language of Instruction	English
Date of production/revision	26/10/2022

Course Coordinator:

Office No.:
Office Hours: Mon. + Wed. (11:30-12:30 PM)
Email: ghaidarumman@iu.edu.jo

Other Instructors:

No other instructor

Course Description:

This is an introductory course in water and wastewater analysis. The intent of this course is to enrich the students of civil Engineering with the basic parameters that should be tested in water and waste water including: pH, alkalinity, chloride, hard and soft water, chlorine, dissolved oxygen, BOD (biochemical oxygen demand), COD (chemical oxygen demand), coliform test, suspended and dissolved solids, coagulation and flocculation, water hardness removal.

Text Book: Author(s), Title, Publisher, Edition, Year, Book website.

Hammer J., and Hammer Jr., 2012, Water and Wastewater Technology, 7th ed., Pearson Education Inc., New Jersey, USA.

References: Author(s), Title, Publisher, Edition, Year, Book website.

Required book (s), assigned reading and audio-visuals: Introductory to wastewater Engineering laboratory on line videos
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Course Educational Objectives (CEO): Maximum six brief educational goals.

1.	To address the importance of the subject of water and wastewater laboratory
2.	To have the ability to analysis analytically the water and wastewater samples in the laboratory.
3.	Teaching the student how to conduct and analyse the results of chemical and physical analysis of surface water, drinking water and wastewater
4.	Defining the permissible limits of the water pollutants
5.	To have the ability to take samples and test water and wastewater at field.

Intending Learning Outcomes (ILO's): Please write no more than 8 learning outcomes

	Intending Learning Outcomes (ILO's)	Relationship to CEO	Contribution in Program SOs
1.	To be able to determine the acidity and alkalinity of the aqueous samples	1,2,3	2,4
2.	To be able to determine the hardness its removal techniques from drinking water	1,2,3,4	2,4
3.	To be able to determine the chloride salts concentration and their effects.	1,2,3,4	2,4
4.	To be able to know the concept of biological and chemical oxygen demands and their analysis steps	1,2,3	2,4
5.	To be able to determine the total solids	1,2,3	2,4
6.	To be able to determine the required coagulant dose by using jar test experiment	1,2,3	2,4

Topic Outline and Schedule:

Topic	Weeks	Achieved ILOs	Evaluation Methods	Reference
Introduction + pH	1	1	Report	Ch.1+2
Acidity + alkalinity	2	1	Report	Ch.1+2
hardness	3,4	2	Report	Ch.1+2
Chloride +EC	5	3	Report	Ch.1+2
DO +BOD	6,7	4	Report	Ch.1+2
COD	8	4	Report	Ch.1+2
TDS + TSS	9	5	Report	Ch.1+2
Jar Test	10	6	Report	Ch.1+2
Final exam				

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Lectures on line
- Lab hands on line

Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

- Homework hand in on line
- Quizzes hand in on line
- Written Exam hand in on line

Course Policies:

- Attendance is mandatory.
- All students are required to bring their class notes in all classes.
- No students are allowed to attend in classes of other section.
- All assignments should be submitted in class and will not be accepted afterwards.
- All exams will be closed book and closed notes.
- The only calculators allowed for use in this course are those permitted according to the Faculty of Engineering standards.
- Cheating during exams, plagiarism, and unauthorized collaboration with colleagues in solving assignments will not be tolerated.

- In case of missing any exam, sufficient documentation of the reasons should be provided to the instructor for approval. **In case of approval**, faculty's Make up exam policy will be followed.

Required equipment:

Labs, on line videos for the experiments

Software :No need

Hardware:No need

Assessment Plan for the Course Learning Outcome (just select):

- ☐ First Written Exam.
- ☐ Second Written Exam.
- ☒ Final Written on line Exam.
- ☒ Quizzes.
- ☒ Homework.
- ☒ Integrative Projects.
- ☐ Case Study.
- ☐ Written Reports.
- ☒ Participation in Lecture.
- ☐ Practice in the Lab.
- ☐ Illustrative Presentations.
- ☒ Oral Exams.
- ☐ Others (identify):

Program Student Outcome (SOs):

Student Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the Civil Engineering program will demonstrate	
1	Knowledge of the basics of mathematics, science and engineering with deep knowledge of civil engineering.
2	Achieve and identify engineering problems, social knowledge, health, safety, legal, management, sustainability and cultural issues and the consequent responsibility towards civil engineering.
3	Ability to apply knowledge in mathematics, science and engineering.
4	Ability to design, conduct experiments, analyse and interpret data.
5	The ability to design a system, component or process to meet the needs required within the constraints of real economic, environmental, social, political and moral in addition to the requirements of health, safety, construction and sustainability.
6	Ability to identify, formulate and solve engineering problems.
7	Extensive education necessary to explain the impact of engineering solutions in a comprehensive economic, environmental and social context.
8	Ability to use the techniques, skills and modern engineering tools for engineering practices.
9	Ability to work with multidisciplinary teams.
10	Apply knowledge of basic technical areas appropriate to civil engineering including but not limited to structural, geotechnical, environmental, transportation and water resources engineering.
11	Ability to clarify basic concepts in management, business, public policy and leadership.
12	Realize the need for lifelong learning and possess the competence to do so.
13	Understanding and adhering to professional ethics, and the social, cultural and environmental responsibilities of civil engineers.
14	Ability to communicate effectively in written or oral forms.
15	Ability to clarify the importance of professional licensure.

Responsible Persons and their Signatures:

Course Coordinator	Dr .Ghaida Abu-Rumman	Completed Date	1/ 10 /2020
		Signature	
Received by (Department Head)	Dr. Ibrahim Farouqa	Received Date	/ /
		Signature	