Theoretical and practical courses-Ilam University of Medical Sciences

* Introduction to the lesson: Water treatment plant design

* Second semester 400-99

* School: Health

* Department: Environmental Health

* Name and course number: Design of water treatment plant

* Field and degree: Environmental Health - Master

* Day and time: Tuesday 12-10

* Venue: Department of the group

* Name of the person in charge of the course (course instructor): PhD teacher

* Prerequisite courses: -

* Office address: Ilam School of Health - Department of Environmental Health

* Email address: m_f_1859@yahoo.com

General purpose of the lesson:

• **Behavioral goals** (behavioral goals have an audience, behavioral verb, degree and criteria and conditions of performance)

Familiarity with water treatment stages, criteria and components of water treatment plant and acquiring water treatment plant design skills and operation and process control in water treatment plant

• **Student duties** (student homework during the semester)

• **Main sources** (observing the principles of source writing and giving an address for their preparation, including library, bookstore, internet ...)

1- Crittenden JC, Trussell RR, Hand DW, Home KJ, Tchobanoglous G, MWHS. "Water treatment: principals and design". John Wiley & Sons; 2012 jun 14.

2- Qasim Syed R., Motley Edward M., Zhu Guang. Water works Engineering: planning, Design and operation. Published by prentice Hall, 2000.

3- Kawamura S., "Integrated Design and operation of water Treatment facilities". John Wiley & Sons; 2nd edition, 2000 /

• **Teaching methods and teaching aids used**: Teaching is done by lecture method (whiteboard and magic) and using teaching aids (slides).

• Methods and time of assessment and evaluation of the student and the bar related to each assessment:

Method	Score	Date	Time
Reporting and presentation	5	During semester	

Active presence	2		
End of semester	13	End semester	

Lesson rules and expectations from students

- Regular attendance at class

- Observing discipline

- Do homework

- Schedule of presentation of water treatment plant design lesson plan for the second semester 2020-2021

Session	Topic	lecturer	Necessary preparation of students before the start of the class -
1	Lesson statement, teaching method, assessment methods, expectations, classroom rules, subject matter, introduction to standards and rules, water resources, water treatment, treatment objectives	Dr. Adiban	
2	Basic considerations of water treatment plant design (design life, population, etc.) and pre-design studies		Study the contents of the past and get acquainted with the contents of the next session
3	Reservoir design, types of reservoirs, design criteria and factors affecting it		
4	Aeration unit for removal of iron and manganese, other aeration systems		
5	Design of aeration and aeration unit, design principles		
6	Coagulation and flocculation ponds, coagulation and flocculation considerations, types of coagulation and flocculation methods		
7	Main points and influences on coagulation and flocculation, design of coagulation and flocculation unit		
8	Sedimentation units, sedimentation targets, types of sedimentation units, sedimentation mechanisms		
9	Design criteria in each sedimentation unit, estimating the amount of sludge		
10	Filtration, types of filtration, number and size of filters		
11	Appendices of filtration units, design of rapid filtration unit		
12	Decontamination, design of decontamination unit,		
13	Taste and odor removal, causes of taste and odor in water, taste and odor removal methods in water Design process.		
14	Water disinfection, principles and purposes of water		

	disinfection, types of disinfection methods		
15	Factors affecting disinfection, disinfection unit design criteria, disinfection unit design		
16	Designing a municipal wastewater treatment plant and determining its units and other parameters		
17	End of semester exam		