Theoretical and practical courses-Ilam University of Medical Sciences

Introduction of the course: Industrial wastewater management in the second semester of the academic year 2020-2021

School: Health

Department: Environmental Health Engineering

Course and degree: Environmental Health - Master

Day, time and place: Monday 10-12

Number and type of theoretical unit 2 Name of the person in charge of the course (course instructor): Ali Nikonhad

Prerequisite courses:

Office address: School of Health

Phone and contact days: 09188425954

Overall Objective of the lesson: Creating expertise to select the best solution to deal with the problems of industrial wastewater pollution and how to use various physical, chemical, biological processes in the design of wastewater treatment plants for important industries

Lesson Description: Industrial wastewater is water that is used in the production and manufacture of a commercial product and is removed from the system as a by-product. Industrial wastewater is a by-product of manufacturing plants. Various factories that can produce the food, clothing, beverages, paper and all kinds of chemicals we need. In all these products, water is used as a consumable part of the production process. Due to the diversity of industrial factories and the high volume of industrial wastewater in the country, we need to identify appropriate methods for the management and treatment of industrial wastewater. . The first step in managing industrial wastewater is to fully understand the effluent of factories. In this course, while introducing different types of industrial wastewaters, their management and treatment methods will be explained.

Specific or partial objectives of the course:

The specific objectives of this course are as follows:

1- The student can divide industries in terms of water consumption and wastewater production

2- The student can know and interpret the quantitative and qualitative characteristics of the country's industrial wastewater

3- The student can explain the reason for the difference in nature in industrial wastewater

4- The student should know the standards of industrial wastewater disposal in Iran

5- The student should know the standards of industrial wastewater disposal in the world

6- The student can explain the effects of industrial wastewater disposal on the environment

7- The student can explain the reason for the difference in Iranian and world standards

8- The student can divide industries in terms of water consumption and wastewater production

9- The student can know and interpret the quantitative and qualitative characteristics of the country's industrial wastewater

10- The student can explain the reason for the difference in nature in industrial wastewater

11- The student should know the standards of industrial wastewater disposal in Iran

12- The student should know the standards of industrial wastewater disposal in the world

13- The student can explain the effects of industrial wastewater disposal on the environment

14- The student can explain the reason for the difference in Iranian and world standards

15- The student knows the method of process changes.

16- The student should know the method of changing and modifying the equipment

17-- The student knows the method of sewage separation.

18- The student should know the method of uniformity of sewage.

19- The student should know the method of adjusting the sewage

20- The student should know the method of monitoring sewage flows

21- The student should know the methods of wastewater neutralization

22- The student should know the methods of uniformity and adaptation

23. The student can propose a neutralization method and a 4- standardization method for a specific industrial wastewater.

24- The student should know the settling methods.

25- The student should know the methods of flotation

26. The student should know the reason for the separation of each of these parts

27- The student should know the various methods of removing colloidal solids

Student duties (student homework during the semester):

1- Studying the issues raised in previous meetings

2- Asking possible questions about the ambiguities of the previous session

3- Participate in class discussion + do class assignments

The main sources of the lesson: The main sources of the lesson

1- Amir Hossein Mahvi - Abdolmajid Gholizadeh - New technologies of wastewater treatment - Andisheh Mandegar Publications 2014

2- Raufi, Mohammad Kazem- Mallardi, Mohammad Reza- Principles of Water Treatment and Industrial Wastewater- Mobtakaran Publications- Tehran 2002

3- Compiled by Aken Felder - Translated by Turkian, Ayub - Jafarzadeh, Mohammad Taghi - Industrial Wastewater Treatment Volume 1- Industrial Towns Company in collaboration with Haft Aseman Publications - Tehran 2001.

4- Compiled by Aken Felder - Translated by Turkian, Ayub - Azimi Qalibaf, Ehsan - Industrial Wastewater Treatment Volume 2- Industrial Towns Company in collaboration with Haft Aseman Publications - Tehran 2001.

5. Jr. w. wesely- Es kenfeld- 1999- Industrial water pollution control- Mcgraw Hill- New York.

6. Frank Woodard-2001- Industrial waste treatment handbook- Butter worth heine Maun.

Teaching method + teaching aids used: video projector, computer and internet, educational articles, Powerpoint

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

- Class question 2 points + quiz 3 points + final exam 15 points

Lesson rules and expectations from students:

Schedule and predicted contents of each theory session

Session	Topic	Necessary preparation of students before the start of the class
1	Quantitative characteristics and quality of industrial wastewaters of different industries	Timely attendance at class Asking possible questions about the lesson
2	Industrial wastewater disposal standards	Study the contents of the previous session lesson Timely attendance at class Asking possible questions about the ambiguities of the previous lesson
3	Industrial wastewater disposal strategies	
4	Methods of reducing the volume of industrial wastewater	
5	Methods for reducing the concentration of industrial	

	wastewater	
6	Methods of pre-treatment of industrial wastewater	
7	Methods for removing suspended solids	
8	Methods for removal of colloidal solids and soluble inorganic and organic solids	
9	Chemical precipitation and coagulation and flocculation in industrial wastewater treatment	
10	Calculation of industrial wastewater pollution load and equivalent population	
11	Specific methods of wastewater treatment (ion exchange, filtration)	
12	Specific wastewater treatment methods (adsorption and AOPs)	
13	Specific methods of wastewater treatment (types of suspended and attached growth methods)	
14	Wastewater treatment methods in some industries	
15	Wastewater treatment plant components	
16	Effluent disinfection methods	
17	Exam	Read the contents of all sessions