

Theoretical courses course plan-Ilam University of Medical Sciences

Introduction of the course: Environmental Health 1 (water) second semester of the academic year 2020-2021

School: Health Department: Environmental Health Engineering

Course and degree: Public Health - Bachelor of the day, time and place: 2-4

Number and type of theoretical unit 1

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

General Objective of the lesson: Familiarity with water pollution and different stages of water treatment and how water treatment processes

Course description: In this course, students are introduced to the types of water resources, the role of water resources in human life, types of water pollution and physical, chemical and biological treatment of drinking water.

Specific or partial objectives of the course: At the end of this course, students can:

- 1- Explain the types of surface and groundwater resources and its qualitative differences.
- 2- Explain the methods of removing various contaminants from water.
- 3- Know the preliminary water treatment units and the design principles of each.
- 4- Learn the process of sedimentation of suspended and colloidal particles and the corresponding sedimentation pond Design
- 5- Learn the coagulation process and design fast and slow mixing.
- 6- Calculate the amount of chemicals and waste produced in different units of water treatment plant Show.
- 7- Explain the types of sand filters and the working principles of each.
- 8- Learn the methods of water disinfection and calculations related to chlorination and implement them in practice
- 9- Learn and explain the various methods of removing nitrate, sulfate, fluoride and taste and smell from water.

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:

- 1- Water purification / Vali Alipour, Idris Bazrafshan, Soroush Sepahan Publications-Tehran, first edition, 2002
- 2- Raufi, Mohammad Kazem- Mallardi, Mohammad Reza- Principles of Water Treatment and Industrial Wastewater- Mobtakaran Publications- Tehran 2002
- 3- Zazoli and Bazrafshan - Water and Sewerage Technology - Volume 1 of Samat Publishing
- 1) Handbook of public water systems, second edition HDR, Engineering, Inc., John Wiley, 2001

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 (changes may occur if the coronary conditions continue)

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	-Water cycle, the health importance of water and its relationship with health - Types of water sources	Timely attendance at class Asking possible questions about the lesson
2	<ul style="list-style-type: none"> • Groundwater properties • Characteristics of surface water • Properties of brackish water • Water standard 	Study the contents of the previous session lesson Timely attendance at class Asking possible questions about the ambiguities of the previous lesson
3	Chemical parameters of water	
4	Hardness and methods of removing hardness from water	
5	• Rapid mixing unit	

	<ul style="list-style-type: none"> • Coagulation and flocculation • Coagulation mechanisms • Mechanism of work of coagulants • Comparison of coagulants with each other <p>Factors affecting coagulation</p> <ul style="list-style-type: none"> • Coagulants help • Jar test method 	
6	Types of filtration	
7	<ul style="list-style-type: none"> • Gases and methods of removing them from water • Physical methods for removing gases from water (hydrogen sulfide, chlorine, ammonia and oxygen) • Eliminate gases with aerators • Chemical removal of gases from water 	
8	<ul style="list-style-type: none"> • Different methods of disinfection • Types of disinfectants • Disinfection mechanism <p>Factors affecting water disinfection performance</p> <ul style="list-style-type: none"> • Problems caused by disinfectants 	
9	<p>Pollution of rivers</p> <p>Phenomena of overeating</p> <p>River self-purification</p>	