Theoretical and practical course plan form - Ilam University of Medical Sciences

School: Health

Introduction to the lesson

Department: Environmental Health

Course Title: Fluid Mechanics

Student: Environmental Health Engineering

Prerequisite Courses: Mathematics 1 and 2, Differential Equations, General Physics

Venue: School of Health Name of course manager (instructor):Dr. Moayed Adiban

Number of credits: 2

Teaching time: Degree of students: Bachelor

Email address: Adiban-m@medilam.ac.ir

General purpose of the lesson:

In this course, students will become familiar with the physical properties of fluids, the behavior of fluids at rest and motion, relationships and various functional equations. This course is a basic course in hydraulics, water transfer and distribution, wastewater collection, air pollution control methods and so on. By passing this course, students will apply the relevant rules in designing water and sewage systems and controlling air pollution and other similar cases.

Lecturer's study resources:

1. Hassan Madani, Fluid Mechanics and Hydraulics, University Jihad Publications 1985

2. - Fluid Mechanics, Robert W, Fox, Alan T. McDernald, translated by Bahram Yousefi

3. Streeter V.L. and Wylie E.B, Fluid Mechanics, McGraw-Hill Publishing Company 1981.

4. Glies R.V., Fluid Mechanics and Hydraulic, McGraw-Hill Publishing Company 1997.

5. Hamill L. Understanding Hydraulics, Macmillon Press 1995.

6. Douglas J.F., Gasiorek, J., M-Swaffield. Fluid Mechanics. Longman Scientific Thechnical 2000

Student Exam Resources:

1. Hassan Madani, Fluid Mechanics and Hydraulics, University Jihad Publications 1985

2. - Fluid Mechanics, Robert W, Fox, Alan T. McDernald, translated by Bahram Yousefi

3. Streeter V.L. and Wylie E.B, Fluid Mechanics, McGraw-Hill Publishing Company 1981.

4. Glies R.V., Fluid Mechanics and Hydraulic, McGraw-Hill Publishing Company 1997.

5. Hamill L. Understanding Hydraulics, Macmillon Press 1995.

6. Douglas J.F., Gasiorek, J., M-Swaffield. Fluid Mechanics. Longman Scientific Thechnical 2000

How to evaluate a student during the course:

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

Method	Score	Date	Time
solve problems	2	During semester	Scheduled training hours
midterm	4		
End of term exam	14	End semester	
Total	20		

Student assignments during the course:

-Solve the exercises presented in class

-Participate in answering course questions

-Participate in the evaluations of each session and solve assignments

Teaching methods and teaching aids used

The teaching method in this course will be in the form of group discussion, problem solving, question and answer and using magic and whiteboard as well as using other educational media as needed.

Lesson rules and expectations from students

1- Attending the class on time and based on the set time

2- Observance of education and disciplinary regulations

3- Studying the contents of the previous session and preparing to attend the class

4- Solve problems at home and answer on the due date

5- According to the educational regulations, unjustified absence in the final exam will be considered as a score of zero and justified absence will cause the removal of that course.

Fluid Mechanics Curriculum for the Second Semester 2020-2021

Session	Specific Objectives (Outline)	Specific behavioral goals	Lecturer	Necessary preparation of students before the start of the class
1	Introduction to the lesson and basic concepts of fluids	The student should be able to explain the introduction and basic concepts of fluids.	Dr..adiban	
2	Physical properties of fluids	The student should be able to describe the physical properties of fluids such as compressibility, specific gravity, specific gravity, viscosity, etc.		review the contents of the previous session
3	the unit. Fluid equations and how to	The student should be able to get		

	convert units	acquainted with MKS, SI, CGS, English engineering, etc. systems and convert units.		
4	Types of pressures, air pressure or barometer, absolute pressure, steam pressure	The student should be able to explain how to calculate the pressure in pressurized pipes, tanks, etc.		
5	Principles of pressure measurement, metal barometers, tubular barometers, differential barometers	The student should be able to explain how to determine the pressure with pressure gauges such as piezometers, manometers, etc.		
6	Hydrostatic: general principles, pressure diagram, pressure (types of pressure with measuring instruments and hydrostatic force	The student should be able to explain how to calculate the force on submerged objects and surfaces		
7	Hydrostatic: The effect of force on flat plates, the point of hydrostatic effect, hydrostatic force on curved and flat plates and solving problem exercises	The student should be able to explain the effect of force on the flat flattened plates, the point of effect of the hydrostatic and the hydrostatic force on the curved and flattened plates.		
8	Floating object stability (Factors affecting floating body stability, metastatic height calculations of floating volume)	The student should be able to explain the calculations of the stability of floating objects and the metastatic height of the floating volume.		
9	Hydrodynamics (general principles, classification of different types of fluids)	The student must be able to perform different types of fluids and calculate their physical properties.		
10	Hydrodynamic (flow continuity equation, energy equation)	The student should describe the equations of flow continuity, the types of energy forms in pressurized pipes		
11	Hydrodynamic: (Bernoulli equation)	The student should be able to explain the application and how to use the Bernoulli equation and how to calculate the hydraulic slope and energy.		
12	Reynolds number	The student should be able to determine the type of flow (slow, intermediate and mixed) by calculating the Reynolds number.		
13	Hydraulic gradient and energy	The student should be able to calculate the hydraulic slope and how it changes the flow of the pipe with the help of hydraulic relations.		
14	Fluid motion equations: Darcy Wiesbach equation	The student should be able to calculate the amount of pressure drop with the help of Darcy Wiesbach's relation.		
15	Fluid Motion Equations: Haysen Williams Equation	The student should be able to explain the relationship between the flow of water in a pipe with the physical properties of the pipe and the pressure drop due to friction with the help of		

		Haysen Williams.		
16	Fluid Equations: Manning Equation	The student should be able to explain open channel flow with the help of the Manning relation.		
17	Fluid motion equations: the equation of object and base	The student should be able to explain the calculations related to uniform flow in open channels with the help of object relations.		