Theoretical and practical course plan form

Ilam University of Medical Sciences

Health school

Introduction to the lesson

Department: Environmental Health

Course Title: Fluid Mechanics

Student: Occupational Health Engineering

Prerequisite Courses: Solid Mechanics, Physics (1), Physics (2), General Mathematics (2)

Venue: School of Public Health Name of the course

(instructor): Dr. Moayed Adiban

Number of credits: 3 theoretical credits Teaching time: Monday 10-8

Wednesday 12-10

Students Degree: Bachelor

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

General purpose of the lesson:

Familiarity of students with the principles and laws of fluid mechanics and their application in ventilation and heat transfer

Lecturer's study resources:

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

2. - Fluid mechanics and its application in engineering, Jalil Famili

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

Student Exam Resources:

Hassan Madani, Fluid Mechanics and Hydraulics, Jihad Daneshgahi Publications 1985

- Fluid mechanics and its application in engineering, Jalil Famili

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

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

How to evaluate a student during the course:

session	score	date	time
solve problems	2	Semester length	Scheduled training hours
midterm	4	Semester length	Scheduled training hours
End of term exam	14	End of semester	Scheduled training hours
Total	20		Scheduled training hours

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 training 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.

Schedule for presenting the occupational health fluid mechanics curriculum for the second semester 2020-2021

session	date	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 and their application in ventilation and heat	The student should be able to explain the introduction and basic concepts of fluids.	Dr. Adiban	-

		transfer			
2		Units and quantities and how to convert units	The student should be able to get acquainted with MKS, SI, CGS, English engineering, etc. systems and convert units.	Dr. Adiban	knowing the contents of the previous session
3		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.	Dr. Adiban	
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.	Dr. Adiban	knowing the contents of the previous session
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.	Dr. Adiban	knowing the contents of the previous session
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	Dr. Adiban	knowing the contents of the previous session
7		Hydrostatic: static equations of fluids, forces acting on different surfaces,	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.	Dr. Mazloumi	knowing the contents of the previous session
8		Hydrostatic: buoyancy force, immersion balance and floating relative equilibrium	The student should be able to explain the calculations of the stability of floating objects and the metastatic height of the floating volume.	Dr. Mazloumi	

9		Hydrodynamics: flow characteristics (flow lines, flow, energy, etc.)	The student must be able to perform different types of fluids and calculate their physical properties.	Dr. Mazloumi	knowing the contents of the previous session
10		Hydrodynamics: General principles of fluid classification, incompressible fluid equations, and fundamental relationships	The student should describe the equations of flow continuity, the types of energy forms in pressurized pipes	Dr. Mazloumi	knowing the contents of the previous session
11		Hydrodynamic: (flow continuity equation, Bernoulli, energy equation)	The student should describe the equations of flow continuity, the types of energy forms in pressurized pipes	Dr. Mazloumi	knowing the contents of the previous session
12		Dimensional numbers: Reynolds number, Mach number and ...	The student should be able to determine the type of flow (slow, intermediate and mixed) by calculating the Reynolds number.	Dr. Mazloumi	knowing the contents of the previous session
13		Channel flow resistance, hydraulic slope 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.	Dr. Mazloumi	knowing the contents of the previous session
14		Types of falls: due to friction, flow turbulence, bends and splits, etc.		Dr. Adiban	knowing the contents of the previous session
15		Fluid Equations: Darcy Wiesbach Equation	The student should be able to calculate the pressure drop with the help of Darcy Welsbach's relation.	Dr. Adiban	knowing the contents of the previous session
16		Fluid Equations: Manning Equation	The student should be able to explain open channel flow with the help of the Manning relation.	Dr. Adiban	knowing the contents of the previous session
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	Dr. Adiban	knowing the contents of the previous session

			of object relations.		
18		Orifices and Venturi meters	The student should be able to theoretically explain the calculations related to iodine flow in canals with the help of orifice and venturi meters.	Dr. Adiban	knowing the contents of the previous session
19		Laws of thermodynamics in fluid mechanics	Students will be introduced to the basics of the use of thermodynamics in fluid mechanics	Dr. Adiban	knowing the contents of the previous session
20		Complete gas relations	Students can get acquainted with the characteristics of complete gases and be able to analyze equations with the help of related relationships and by changing the variables involved in it.	Dr. Adiban	knowing the contents of the previous session
21		Sound waves	Familiarity of students with the basics and definitions of sound	Dr. Adiban	knowing the contents of the previous session
22		Isontropic flow	Familiarity of students with the characteristics of isotropic entropy flow and its effect on the properties of a fluid	Dr. Adiban	knowing the contents of the previous session
23		Adiabatic flow without friction in the ducts ducts with heat transfer	Familiarity of students with adiabatic flow in canals by considering / not taking into account friction	Dr. Adiban	knowing the contents of the previous session
24		Stable isothermal flow in long pipes	Familiarity of students with stable isothermal flow in long pipes	Dr. Adiban	knowing the contents of the previous session