Course Description Form

1. Course Name:
Fluid Mechanics
2. Course Code:
FLME379
3. Semester / Year:
first semester 2023-2024
4. Description Preparation Date:
1/2/2024
5. Available Attendance Forms:
Combined (Attendance + distance education)
6. Number of Credit Hours (Total) / Number of Units (Total)
30 theoretical hours +45 practical hours =75 hours / 3.5 Units
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Mohammad Ameen Saeed Email:ahmed_ameem@uomosul.edu.iq Salih Sabrry Ali
8. Course Objectives
1- Introducing the student to how to use conversion tables (energy, pressure, mass, momentum...) And use it in designs, analyses, and flow sciences 2- Increasing the student's knowledge of how pressure occurs and knowing the types and measuring devices 3- Study losses in pipes and curves and develop correct designs for drainage in pipes 4- The student's understanding, complete knowledge, and familiarity with the subject of pumps, their types and parts, how they work and operate, finding their costs and pressures, and the ability necessary for that.
9. Teaching and Learning Strategies
1-Interactive lecture 2-Brainstorming 3-Dialogue and discussion 4-Field Training 5-Practical exercises 6-Field project 7-Self-education

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical	a1 knows the meaning of fluid, fluid properties, fluid mechanics, and standard units used to study fluids	Definition of fluid and its relationship to fluid mechanics and fluid properties	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the properties of fluids	Definition of fluid and its relationship to fluid mechanics and fluid properties	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
2	2 theoretical	a2 learns about the meaning of pressure, pressure units, and atmospheric pressure, as well as the basic equations of fluid balance	Hydrostatics (the science of fluid balance)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about hydrostatics (the science of fluid balance)	Hydrostatics (the science of fluid balance)	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
3	2 theoretical	c1 enumerates the types of pressure gauges and knows how each type works	Pressure measuring devices	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about pressure measuring devices	Pressure measuring devices	Interactive lecture, brainstorming, dialogue and discussion, field training,	Short daily test1 Semester test1 Final test

				and self-learning	
4	2 theoretical	a5 the student distinguishes the laws and equations related to the forces acting on flat and inclined curved surfaces of liquids	Forces acting on surfaces due to static fluid pressure	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 it solves mathematical problems about the forces acting on surfaces in the case of a static fluid	Forces acting on surfaces due to static fluid pressure	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
5	2 theoretical	a2 the student learns about the equilibrium conditions for a body completely or partially immersed in a liquid	Equilibrium of submerged and floating bodies in a liquid (conditions of equilibrium)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the balance of submerged bodies	Equilibrium of submerged and floating bodies in a liquid (conditions of equilibrium)	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
6	2 theoretical	a2the student understands the classifications of flow types for fluids and how to derive the continuity equation for fluid flow	Fluid flow, flow classification, and continuity equation	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about types of flow and the continuity equation for flow	Fluid flow, flow classification, and continuity equation	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
7	2 theoretical	a1 the student knows the derivation of bernoulli's equation and its practical applications	Fluid flow and Bernoulli's equation	Interactive lecture, brainstorming, dialogue	Short daily test1

				and discussion, self-learning	Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the bernoulli equation and its applications	Fluid flow and Bernoulli's equation	Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
8	2 theoretical	c2 the student benefits from machines and devices that work on applications of the momentum equation	Principles of momentum	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the momentum equation for steady flow and its applications	Principles of momentum	Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
9	2 theoretical	a2 the student learns how to find the reynolds number and how to use the darcy equation	The flow of liquid in pipes, Reynolds' experiment, and Darcy's equation	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 solves mathematical problems about the reynolds number and the darcy equation	The flow of liquid in pipes, Reynolds' experiment, and Darcy's equation	Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
10	2 theoretical	a4the student explains how to find the marginal roughness coefficient for pipes and the coefficient of friction for types of flow	Fluid flow and study of losses through pipes due to friction	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments	Fluid flow and study of losses through pipes due to friction	Interactive lecture, brainstormin	Short daily test1

		a3 and solves mathematical problems about the coefficient of friction and marginal roughness		g, dialogue and discussion, field training, and self-learning	Semester test1 Final test
11	2 theoretical	c1 the student enumerates the laws and equations related to the various losses resulting from flow in pipes	Fluid flow and study of losses through pipes	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about charge loss as a result of flow in its various states	Fluid flow and study of losses through pipes	Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
12	2 theoretical	a1 the student knows the laws for equivalent pipe and tank emptying	Flow in a pipeline	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 solves mathematical problems about flow in a pipeline	Flow in a pipeline	Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
13	2 theoretical	a2the student understands and knows the principles used in classifying pumps in general and centrifugal pumps in particular	Types of pumps and centrifugal pumps	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the velocity trigonometry diagram of a centrifugal pump	Types of pumps and centrifugal pumps	Interactive lecture, brainstormin g, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test

14	2 theoretical	a2 the student understands everything related to the performance and operation of centrifugal pumps	Performance of centrifugal pumps	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4the student conducts experiments a3 and solves mathematical problems about the performance of centrifugal pumps	Performance of centrifugal pumps	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test
15	2 theoretical	a2 the student understands and knows the types of positive displacement pumps, their operation and performance	Positive displacement pumps (reciprocating and rotary)	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short daily test1 Semester test1 Final test
	3 Practical	c4 the student conducts experiments and solves mathematical problems a3 about positive displacement pumps	Positive displacement pumps (reciprocating and rotary)	Interactive lecture, brainstorming, dialogue and discussion, field training, and self-learning	Short daily test1 Semester test1 Final test

11. Course Evaluation

Seq.	Evaluating style	date	marks	Relative weight
1	Home reports	every week	10	10%
2	Short tests	every week	10	10%
3	Semester test 1	The seventh week	10	10%
4	Semester test 2	The final week	10	10%
5	Final practical test	End of the course	20	20%
6	Final theoretical test	End of the course	40	40%
	the total		100	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- ميكانيك الموائع الدكتور ياسين هاشم الطحان و المهندس عبد الصابر ابراهيم بكر/جامعة الموصل 1990
Main references (sources)	ميكانيك الموائع وتطبيقاتها الهندسية , روبرت ل.دوجرتي وجوزيف ب.فرانزيني . دار ماكروهيل للنشر1977
Recommended books and references (scientific journals, reports...)	1- ميكانيكا الموائع والهيدروليكا , رينالد ف.جايلز . دار ماكروهيل للنشر 1977

	2-ميكانيك الموائع ترجمة الدكتور نبيل زكي مرقص و الدكتور فوزي HFVHIDL صادق/ 1984 3-Hydraulics and fluid Mechanics .Dr.P.N.Mody ,M.SETH,17th edition .2009
Electronic References, Websites	https://www.youtube.com

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