أسم الجامعة: جامعة ديالى

أسم الكلية: كلية الهندسة

أسم القسم: هندسة الميكانيك

أسم المحاضر: سالم فرمان سلمان

اللقب العلمي: مدرس

المؤهل العلمي: دكتورا

مكان العمل: كلية الهندسة / جامعة ديالى

((أستمارة الخطة التدريسية السنوية))

اسم التدريسي:	سالم فرمان سلمان
البريد الالكتروني:	dr_alizi@yahoo.com
اسم المادة:	**Fluid mechanics**
مقرر الفصل:	**Consists of:** **Lectures:** 30 Classes presenting the concepts, theory and application. Worked examples will also be given to demonstrate how the theory is applied. You will be asked to do some calculations - so bring a calculator. **Assessment:** Exam of 1.5 hours, Multiple Choice Question (MCQ) papers, Laboratories: 1 x 3 hours This laboratory sessions examine how well the theoretical analysis of fluid dynamics describes what we observe in practice. During the laboratory you will take measurements and draw various graphs according to the details on the laboratory sheets. These graphs can be compared with those obtained from theoretical analysis. You will be expected to draw conclusions as to the validity of the theory based on the results you have obtained and the experimental procedure. After you have completed the laboratory you should have obtained a greater understanding as to how the theory relates to practice, what parameters are important in analysis of fluid and where theoretical predictions and experimental measurements may differ. **Homework:** Example sheets: These will be given for each section of the course. Doing these will greatly improve your exam mark. They are course work but do not have credits toward the module. **Lecture notes**: Theses should be studied but explain only the basic outline of the necessary concepts and ideas. **Books:** It is very important do some extra reading in this subject. To do the examples you will definitely need a textbook. Any one of those identified below is adequate and will also be useful for the fluids (and other) modules in higher years - and in work. **Example classes:** There will be example classes each week. You may bring any problems/questions you have about the course and example sheets to these classes.
اهداف المادة: Objectives:	The course will introduce fluid mechanics and establish its relevance in mechanical engineering. Develop the fundamental principles underlying the subject. Demonstrate how these are used for the design of simple hydraulic components.
التفاصيل الاساسيه للمادة:	Introduction to fluids science, general concepts and definitions, fluid static's, pressure distribution, hydrostatic forces on submerged surfaces and bodies, stability of submerged and floating bodies, accelerated fluids, fluid flow concepts (continuity, energy and momentum equations and their applications), dimensional analysis and similitude, viscous fluid flow (laminar flow between two plates and through circular tubes, boundary layer, pipe flow and frictional losses and moody diagram, minor losses), flow measurements, networks of pipes and pumps.
الكتب المنهجية:	0.4 Books: fluid mechanics, victor L. Streeter , E. Benjamin Wylie , Seventh Edition Any of the books listed below are more than adequate for this module. (You will probably not need any more fluid mechanics books on the rest of the

جمهورية العراق
وزارة التعليم العالي و البحث العلمي
جهاز الإشراف التقويم العلمي

أسم الجامعة: جامعة ديالى
أسم الكلية: كلية الهندسة
أسم القسم: هندسة الميكانيك
أسم المحاضر: سالم فرمان سلمان
اللقب العلمي: مدرس
المؤهل العلمي: دكتورا
مكان العمل: كلية الهندسة / جامعة ديالى

Mechanical Engineering course) Mechanics of Fluids, Massey B S., Van Nostrand Reinhold. Fluid Mechanics, Douglas J F, Gasiorek J M, and Swaffield J A, Longman.	
Mechanical Engineering Hydraulics, Featherstone R E and Nalluri C, Blackwell Science. Hydraulics in Mechanical and Environmental Engineering, Chadwick A, and Morfett J., E & FN Spon - Chapman & Hall. fluid mechanics, and Hydraulics 3/ed , Ranald V. Giles , jack B. Evett cheng Liu (schaum's outline series) fluid mechanics, and Hydraulics machines R.K. Rajput Civil Engineering Hydraulics R.E. Featherstone C. Nalluri	المصادر الخارجية:

الامتحان النهائي	المختبرات	الفصل الثاني	نصف السنة	الفصل الاول	الفصل الدراسي	تقديرات الفصل:
60	-	12.5	15	12.5	الدرجة	

15% نصف السنة	معلومات اضافية:

جمهورية العراق
وزارة التعليم العالي و البحث العلمي
جهاز الإشراف التقويم العلمي

أسم الجامعة: جامعة ديالى
أسم الكلية: كلية الهندسة
أسم القسم: هندسة الميكانيك
أسم المحاضر: سالم فرمان سلمان
اللقب العلمي: مدرس
المؤهل العلمي: دكتورا
مكان العمل: كلية الهندسة / جامعة ديالى

وزارة التعليم العالي
والبحث العلمي
Ministry of Higher Education & Scientific Research

جدول الدروس الأسبوعي – الفصل الدراسي الاول

week	date	subjects	Details
1)		Introduction to fluids science	- system of units - newton's law of viscosity - fluids vs. solids - newtonian / non-newtonian fluids - liquids vs. gasses - causes of viscosity in fluids
2)		general concepts and definitions	- density - mass density - specific weight - relative density - viscosity - coefficient of dynamic viscosity
3)		fluid static's	- fluids statics - pascal's law for pressure at a point - variation of pressure vertically in a fluid under gravity - equality of pressure at the same level in a static fluid
4)		pressure distribution	- general equation for variation of pressure in a static fluid - pressure and head - the piezometer tube manometer - the "u"-tube manometer
5)		pressure distribution	- measurement of pressure difference using a "u"-tube manometer. - advances to the "u" tube manometer. - choice of manometer
6)		hydrostatic forces on submerged surfaces and bodies	- fluid pressure on a surface - resultant force and centre of pressure on a submerged plane surface in a liquid. - how do you calculate the 2nd moment of area? - the second moment of area of some common shapes. - submerged vertical surface - pressure diagrams
7)		hydrostatic forces on submerged surfaces and bodies	- resultant force on a submerged curved surface - Horizontal forces - Vertical forces - Resultant force - The angle the resultant force
8)		stability of submerged and floating bodies	- Hydrostatic buoyant thrust - Stability of floating bodies - Determination of metacentre
9)		stability of submerged and floating bodies	- Periodic time of rolling of a floating body - Liquid ballast and the effective metacentric height

جمهورية العراق
وزارة التعليم العالي و البحث العلمي
جهاز الإشراف التقويم العلمي

أسم الجامعة: جامعة ديالى
أسم الكلية: كلية الهندسة
أسم القسم: هندسة الميكانيك
أسم المحاضر: سالم فرمان سلمان
اللقب العلمي: مدرس
المؤهل العلمي: دكتورا
مكان العمل: كلية الهندسة / جامعة ديالى

week	date	subjects	Details
10)		accelerated fluids	• Accelerations of fluid particles
11)		fluid flow concepts	• Uniform Flow, Steady Flow • Flow rate. • Continuity
12)		The Bernoulli Equation - Work and Energy	• Bernoulli's Equation • An example of the use of the Bernoulli equation. • Pressure Head, Velocity Head, Potential Head and Total Head. • Energy losses due to friction
13)		Applications of the Bernoulli Equation	• Pitot Tube • Pitot Static Tube • Venturi Meter
14)		Applications of the Bernoulli Equation	• Flow Through A Small Orifice • Submerged Orifice
15)		Applications of the Bernoulli Equation	• Flow Over Notches and Weirs
16)		The Momentum Equation	• The Momentum Equation

جمهورية العراق	أسم الجامعة: جامعة ديالى
وزارة التعليم العالي و البحث العلمي	أسم الكلية: كلية الهندسة
جهاز الإشراف التقويم العلمي	أسم القسم: هندسة الميكانيك
	أسم المحاضر: سالم فرمان سلمان
	اللقب العلمي: مدرس
	المؤهل العلمي: دكتورا
	مكان العمل: كلية الهندسة / جامعة ديالى

جدول الدروس الأسبوعي – الفصل الدراسي الثاني

week	date	subjects	details
17)		Application of the Momentum Equation	• The force due the flow around a pipe bend • Force on a pipe nozzle
18)		Application of the Momentum Equation	• Impact of a Jet on a Plane • Force on a curved vane
19)		Application of the Momentum Equation	• Pelton wheel blade • Force due to a jet hitting an inclined plane
20)		Dimensional Analysis	• Dimensions and units • Dimensional Homogeneity • Results of dimensional analysis
21)		Dimensional Analysis	• Buckingham's theorems • Choice of repeating variables • An example
22)		Dimensional Analysis	• Similarity • Models
23)		viscous fluid flow	• laminar flow between two plates
24)		viscous fluid flow	• laminar flow through circular tubes
25)		viscous fluid flow	• boundary layer
26)		fluid flow in pipes	• Analysis of pipelines. • Pressure loss due to friction in a pipeline. • Pressure loss during laminar flow in a pipe • Pressure loss during turbulent flow in a pipe
27)		fluid flow in pipes	• Choice of friction factor f • Local Head Losses • Pipeline Analysis • Pressure Head, Velocity Head, Potential Head and Total Head in a Pipeline. • Flow in pipes with losses due to friction. • Reservoir and Pipe Example
28)		fluid flow in pipes	• Pipes in series • Pipes in parallel • Branched pipes
29)		networks of pipes	• pipes networks analysis
30)		• pumps	• pump pipeline system and design

توقيع العميد:

توقيع الأستاذ: