

Cairo University, Faculty of Engineering															
Mapping Course ILOs to NARS															
Course Title :		Applications of Fluid Mechanics-1													
Course Code :		MEP 3020													
Instructor Name :		Prof.Samy Mourad A.Prof.Mohsen S.Soliman A.Prof. Ahmed A. Ibrahim													
Program(s) that offer the course :		Mechanical Power Engineering													
		Competencies for Engineering Graduates										Competencies for Engineering Specializations (MECHANICAL ENGINEERING)			
Course ILOs On successful completion of the course, students will be able to		1-Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	2-Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	3-Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical & other aspects as appropriate to the discipline & within the principles & contexts of sustainable design & development.	4-Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	5-Practice research techniques and methods of investigation as an inherent part of learning.	6-Plan, supervise and monitor implementation of engineering projects.	7- Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	8- Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	9- Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	10- Appreciate the ongoing need to acquire and apply new knowledge and to practice self, lifelong and other learning strategies.	2.1 Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	2.2 Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	2.3 Select conventional mechanical equipment according to the required performance.	2.4 Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems.
1	Master essential facts and concepts relevant to various types of incompressible flow such as: Viscous flow, Frictionless Flow and Boundary Layer Flow.	1	1	1		1					1				
2	Apply techniques of differential control volume analysis to drive basic governing conservation equations of fluid flow by using different types of coordinate systems.	1	1	1						1	1				
3	Identify mass, linear momentum & energy equations for many incompressible flows.	1			1							1			
4	Identify the importance and physical meaning of each term in the complex non-linear partial differential conservation equations for various types of fluid flows.			1			1			1			1		
5	Apply analytic critical and systematic thinking to solve mass and linear momentum differential conservation equations for various types of fluid flows.			1	1									1	
6	Identify essential boundary conditions, constrains and assumptions required to solve some limited applications of viscous flow problems.		1					1	1				1		
7	Recognize the role and importance of the concept of frictionless flow and conformal mapping techniques to solve some fluid flow problems.			1	1				1					1	
8	Apply the similarity and numerical solution methodology to solve the non-linear differential equations of the boundary layer flow.						1		1	1			1		
9	Search for information related to variety of incompressible viscous flow & boundary layer problems.				1			1		1		1			
10	Exchange knowledge with engineering community.			1					1					1	
11	Work in stressful environment and within constraints.					1	1					1			
12	Communicate effectively.					1		1	1		1				
13	Effectively manage tasks and resources.		1		1								1		
14	Refer to relevant literature	1		1		1					1				