



			Course Speci	ification	<mark>s</mark>					
Programon	which this co	urse is given: Dip	loma of Applic	ations of A	AutomaticCon	trol of Me	ch. Power S	ystems		
Department offering the program:			Mechanical Power Engineering Department - ACC control Lab							
Department offering the course:			chanical Power	· Enginee	ring Departm	ent - ACC	control La	ıb		
Academic Level:			ctive Course	- 1 st Tern	n of the Diplor	naof Grad	luate Studi	es		
Date			Term 2021/202	2						
Semester (b	based on final	exam timing) \Box^{γ}	Fall	Spring						
A- Basic I	nformation									
1. Title:		Selected T	<mark>opics of Ind</mark>	ustrial l	Pipe Lines		Code:	<mark>MEP</mark>		
1. 1100.		couc.	<mark>580</mark>							
2. Units/Cro hrs per wee	I ACTIIPAC	3 Credit hours per week	Tutorial		Practical		Total	3		
B- Profess	sional Inform	nation								
	Overall Aims:	:								
		elective course is	one of the 4 el	ective cou	urses requiren	nents of th	e Diploma	. It is		
	designed to re	view, effectively,	Basic Design (Concepts	& Fundament	al Aspects	of Compre	essible		
	designed to review, effectively, Basic Design Concepts & Fundamental Aspects of Compressible Flow or Gas Dynamics in Piping Systems. Compressible flow occurs in many piping systems and									
	devices. Knowledge of effects of compressibility on pipeline flow is therefore very important. Our purpose is to expand & extend basic analysis given in thermodynamics & fluid mechanics courses									
		ore details some G	•	6	•					
1 Common			•	-			0	e		
description		kills & basic know	-				-			
-	-	le flow types in b					-			
	-	rovide students w	-							
	-	le flow, to develop		-			-	•		
	effects are like	ely to be very imp	ortant, to prov	vide a tho	ugh explanati	on of the a	ssumption	s used in		
	the analysis of	f compressible flo	w, to provide a	a broad co	overage of the	subject of	f compressi	ble flow		
	in both variab	ole & constant are	a ducts. One f	inal goal i	is to provide a	firm foun	dation for	the study		
	of more advanced and specialized aspects of the Gas Dynamics.									
	a) Knowledge	and Understandi	ng:							
	Having successfully completed this course, the post-graduate student should have knowledge and									
	understanding of:									
2. Intended Learning Outcomes of Course (ILOs):	- Essential facts, fundamentals, concepts and principles of compressible flow or Gas Dynamics.									
	- Definition & physical meaning of Speed of sound, Mach number and Mach Cone concepts.									
	-Concepts of stagnation reference properties and critical reference properties in Gas Dynamics.									
	-Derivation of and constraints of basic governing conservation equations (mass, linear									
	momentum and energy) for compressible flow to reach at an optimum solution. Basic analysis of 1-D isontropic flow in converging, diverging or converging-diverging ducts									
	-Basic analysis of 1-D isentropic flow in converging, diverging or converging-diverging ducts. - Difference between Chocking of flow at a throat and Normal Shock Wave in supersonic flow.									
	- Difference between Chocking of flow at a throat and Normal Shock wave in supersonic flow. -The form and methodology of analysis for some practical examples in 1-D isentropic flows in									
	variable area ducts.									
		possible to have a	n isentropic co	mpressib	le flow in a co	nstant are	a duct or a	pipe?		
	• •	s of 1-D adiabatic	-	-						
	· ·	s of 1-D isotherm								
	•					which is ca	lled Ravlei	gh Line		
	-Analysis of 1-D Frictionless flow with heat transfer across the wall which is called Rayleigh Line . -Basic analysis of Normal Shock Wave in all cases of supersonic flow in a constant area duct.									
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D) Intellectual Skills:								ويد الق
	aving successfully com	pleted this c	ourse, the	e student sho	ould hav	e the a	bility to:		
	elect appropriate 1-D	•					·	ow prol	olems.
	elect and apply approp		•		0		-	-	
	nalysis of compressible	•				0	8 . 8 .	8	
	Apply appropriate ana						nic. sonic an	d super	sonic
	ows to solve various g							- Serper	
	analyze and interpret						o solve pract	ical pro	blems
	or real compressible fl		-	- /			o solve pruce	icui pi o	
	pply scientific and eng						ine systems a	nd netw	vorks.
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	uggest possible alterna								
	Apply Gas dynamics e	-		appned pra	ictical e	nginee	ring problen	is such	as gas
	w in both variable and							.	
	Analyze different types			-		•			
	bearch for information		-	-		elevant	to gas dynar	nics.	
	Prepare and present in		ia neat te	chilical repo	orts.				
	General and Transfer		41			41	1 •1•4 4		
	aving successfully com	-		e student sho	ould hav	e the a	bility to:		
			Pe 4 •	1• 4	P* 4 4 *	1	4 1		
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5. Student Assessment Methods

جامعة القاهرة- كلية الهندسة قسم هندسة القوى الميكانيكية



Assessment Schedule	Week				
Assessment 1; Report # A	Week #1				
Assessment 2; Report # B	Week #2				
Assessment 3; Report # C	Week #4				
Assessment 4; Report # 1	Week #6				
Assessment 5; Report # 2	Week #8				
Assessment 6; Report # 3	Week # 10				
Assessment 7; Report # 4	Week #12				
Assessment 8; Report # 5	Week #13				
Assessment 9; – General course Report	Week #14				
Weighting of Assessments					
All in-term works, sheets and reports	30%				
Final-term formal, written Examination	70%				
Project					
Class Test					
Presentation					
Total	100%				
6. List of References:					
1- Several class notes, presentations & Special	Reports prepared by Assoc. Professor Dr. Mohsen S. Soli	man			
	thuizen & William E. Carscallen, MCGRAW-HILL Series				
Aeronautical and Aerosnace Engineering, 199					

Aeronautical and Aerospace Engineering, 1997 3- "Fluid Mechanics", 4th ed., Frank M. White, MCGRAW-HILL, N.Y.

4- "Mechanical Engineering HandBook", CRCnetBase1999, Frank Kreith, CRC Press.

5-"Piping Hand Book", Mohinder L.N., 7th Edition, MCGRAW-HILL, N.Y.

ملاحظة: يوجد عدد كبير من تسجيلات المحاضرات والمادة العلمية والمراجع للمقرر على موقع معمل التحكم: acc-vlab.cu.edu.eg

7. Facilities Required for Teaching and Learning: Data Show & Laptop.					
Course Coordinator:	Associate Professor Dr. Mohsen S. Soliman				
Head of Department:	Professor Sayed Ahmed Kaseb				

Date August 2021