



Engineering Program

Specialty	Electro- Hydraulic Systems
Course Number	20311215
Course name	Industrial Applications of hydraulic systems
Credit Hours	2
Theoretical Hours	2
Practical Hours	0



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Brief Course Description:

- ❖ Hydrostatic system, torque converter, hydraulic transmission, track treat or hydraulic systems, recovery vehicles hydraulic systems, hydraulic diagrams of these systems, functions and defect diagnoses

Course Objectives:

The student should be able to:

hydraulic systems for any industrial applications using in army forces, M88, Chieften, FMTV HEMTT and hydraulic diagrams of these systems

Detailed Course Description:

Unit. Number	Content	Notes	Time Needed
1.	Hydrostatic System	<ul style="list-style-type: none"> Main components of hydrostatic systems, diagrams for hydraulic systems, functions and defect diagnosis 	
2.	Torque Converter	<ul style="list-style-type: none"> Main components of torque converter diagrams for hydraulic systems, function and defect diagnosis 	
3.	Hydraulic transmission for (D966) CAT	<ul style="list-style-type: none"> Introduction for hydraulic transmission, Main components of hydraulic transmission, hydraulic diagrams, function and defect diagnosis 	
4.	Hydraulic systems of (D7G) CA	<ul style="list-style-type: none"> Main components, function hydraulic diagrams 	
5.	Hydraulic systems of Chieftain	<ul style="list-style-type: none"> Main components, function hydraulic diagrams 	
6.	Hydraulic system of M88 A1	<ul style="list-style-type: none"> Main components, function hydraulic diagrams , function and defect diagnosis 	
7.	Hydraulic system of (FMTV)	<ul style="list-style-type: none"> Main components, function hydraulic diagrams troubleshooting of hydraulic systems 	
8.	Hydraulic systems of (HEMTT)	<ul style="list-style-type: none"> Main components, function hydraulic diagrams troubleshooting of hydraulic systems 	

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Lectures

Text Books & References:

References:

1. TMG 2350-256-34-2 SEME ARUCHIEETAIN FV4204 hydraulic pinch. Fluid power hand book.
2. Wheel loader shop manual (A66D CAT).
3. D7G Tractor shop manual CAT.

4. كراسة المعدات الهندسية.
5. كراسة النظام الهيدروليكا لونش الأنقاذ الشيفتين.
6. كراسة النظام الهيدروليكي لآلية (FMTV).
7. كراسة النظام الهيدروليكي لآلية (HEMTT).



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



Electronic Engineering Technology Program

Specialty	Electro – Hydraulic System
Course Number	20311216
Course Title	Industrial applications of hydraulic systems workshops
Credit Hours	2
Theoretical Hours	0
Practical Hours	6



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Brief Course Description:

- ❖ An integrated design project to practice the principles of analysis and design acquired throughout the course of the students study

Course Objectives:

The student should be able to practical of hydraulic systems and components operation

Detailed Course Description:

Unit Number	Unite name	Unite content	Time Needed
1.	Hydrostatic system. Main components of hydrostatic system compare hydraulic diagrams to system machine		1 week
2.	Torque Converter. Main components disassembly and assembly of main components		
3.	hydraulic transmission for(D966) Main components of hydraulic transmission test type hydraulic transmission, disassembly and assembly of gearbox		
4.	Hydraulic systems of (D7G)Cat Main components compare hydraulic diagrams to system machine operating systems, test type systems		
5.	Hydraulic systems of chieftain Main components, function hydraulic diagrams to system machine how operating the systems, system test methods		
6.	Hydraulic systems of M88A1 Main components, compare hydraulic diagrams to systems machine operating systems		
7.	Hydraulic system of (FMTV) Main components compare hydraulic diagrams to systems machine operating system, troubleshooting of hydraulic systems		
8.	Hydraulic systems of (HEMTT) Main components, operating systems, troubleshooting of hydraulic systems		

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Evaluation Strategies:

Exams		Percentage	Date
Exams	Assignments	30%	--/------
	Second Exam	20%	--/------
	Final Exam	50%	--/------
Homework and Projects			
Discussions and lecture Presentations			

Teaching Methodology:

1. Laboratory

Text Books & References:

1. TMG 2350-256-34-2
2. SEME ARUCHIEETAIN FV4204 hydraulic pinch
3. Fluid power hand book
4. Wheel loader shop manual(A66D CAT)
5. D7G Tractor shop manual CAT

6. كراسة المعدات الهندسية.
7. كراسة النظام الهيدروليكا لونش الأنفاذ الشيفتين.
8. كراسة النظام الهيدروليكي لآلية (FMTV).
9. كراسة النظام الهيدروليكي لآلية (HEMTT)

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



Engineering Program

Specialty	Electro- Hydraulic Systems
Course Number	20311211
Course Title	Electro – Hydraulic Systems 1
Credit Hours	3
Theoretical Hours	3
Practical Hours	0



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Brief Course Description:

- ❖ Electro-hydraulic circuit, function, components, diagrams defect inspection for hydraulic systems used in artillery vehicles

Course Objectives:

- ❖ To enable the Electro-Hydraulic specialists to and list the hydraulic, electric pneumatic systems in the army our vehicles operating the Jordan army forces – which include the study of schematic diagrams of the system send to know its components such as motors, pumps, reservoirs, valves, Ganges, filters, cylinders, restrictors, hydraulic gear boxes, gun systems like elevation, recoil, hydraulic suspension, rammers, torque, Converter etc ...



Detailed Course Description:

Unit Number	Content	Notes	Time Needed
1.	The study and listing of systems diagrams introduction of components for the followings	<ul style="list-style-type: none"> ▪ Power pack hydraulic diagram. ▪ Manual and power elevation hydraulic diagram. ▪ Manual and power traverse hydraulic diagram. ▪ Rammer hydraulic diagram. ▪ Equilibrator hydraulic diagram. ▪ Suspension and recoil spade hydraulic system 	
2.	The study and analyses of operating circuits and its components of the followings	<ul style="list-style-type: none"> ▪ Electrical operating circuit of power pack and pressure ▪ Switch electrical operating circuit of control handles. ▪ Electrical operating circuit of power elevation. ▪ Electrical operating circuit of power traversing (Lot raining hauls) 	
3.		<ul style="list-style-type: none"> ▪ The study of main electro hydraulic systems and its components and its function. ▪ Power pack, electric motor and pressure switch, reservoir, piston, relief valve, pressure Gauge, Oil index , Oil pump, Oil filters, control handles, and control valves, elevation auxiliary accumulator and manual pump elevating cylinder, locking valves and Relive valves cylinder, piston valve manifold, Axle(Trunnion) Retainer elevation control valves manual, elevation system manual, 	

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

		<p>elevation pump, Accumulator, Feed (supply) valve, shuttle valve, Equilibrator cylinder, primary and secondary Accumulators relieve valve, Traversing Mechanism, Traversing Bypass and control valve, No back and traverse magnetic clutch Oil pump , Traverse gear box manual , traverse Assembly hydraulic motor rammer system , rammer system operating valves Rammer cylinder piston, Tray Assembly handle and support, Assembly operating valves, Recoil system(mech), Recoil cylinder(Buffer), Recuperate cylinder , Buffer Cylinder, Replenished, Variable recoil</p> <ul style="list-style-type: none"> ▪ Mechanism, breather valves(front and rear) hydraulic suspension system, hydraulic suspension system parts, hydraulic suspension system parts function, hydraulic suspension system parts principle of operation, recoil spade main parts and components, main parts and components function, main parts and components principle of operation, (4 training hours) 	
<p>4.</p>	<p>Study and follow electro hydraulic circuits</p>	<ul style="list-style-type: none"> ▪ Fault finding power pack motor electrical operating circuits. ▪ Manual elevation hydraulic circuits. ▪ Manual and electro-Hydraulic traverse circuits. 	

		<ul style="list-style-type: none"> ▪ Slip ring electrical circuits. ▪ Loader and Rammer power operating circuits. ▪ Recoil spade hydraulic circuit. ▪ (5 Training Hours). 	
5.	To know the operating of 120mm gun and its	<ul style="list-style-type: none"> ▪ components , Barrel, Barrel body (construction), fume extractor (Evacuator chamber), thermal sleeve, Equilibration rings, bregch ring assembly auto loader, breech block, gas and bturator assembly, firing needle, breech operating Assembly, Semi-Automatic cam assembly, breech block opening and closing handles, crank assembly gun cradle, breech block closing spring and crank ▪ evaluation (Grading) 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Lectures



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Text Books & References:

1. Tmer – 7910-34-2-2, US Army.
2. Tmer – 7910-34-2, US Army.
3. TM9 – 2350-275-20-2, US Army.
4. TM9 – 2350 - 253-20 - 2 US Army.
5. TM9 – 1000 – 213 – 3 US Army.
6. TM9 – 2400 – 378 – 35 – 2 – 2 - US Army.
7. Trouble shooting of hydraulic system , prepared by Mustafa Shaban, University of Jordan, Industrial Engineering Department 1993 – 1992.
8. Fluid power handbook, directory by Editors of hydraulic and pneumatics. 1992-1993.
9. Using industrial hydraulics
10. ics by T.C Franken Enfield.

1. اصول الهيدروليك الهندسي م.ك ترجمة احمد فيصل اصفري وزارة التعليم العالي . الجمهورية العربية السورية 1977.
2. ميكانيكا الموائع و الهيدروليكا – رينا لدف جاليز . ترجمة الدكتور عمرو محمود صبري . دار ماكجرو هيل للنشر 1981.
3. كراسة م.ابراج طارق بن زياد كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.
4. كراسة م.ابراج الدبابة م.1.0.6 و م.3أ6 كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.
5. كراسة م.ابراج الدبابة م.109 . م110 كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية





Engineering Program

Specialty	Electro- Hydraulic Systems
Course Number	20311212
Course Title	Electro – Hydraulic Systems1 Workshops
Credit Hours	1
Theoretical Hours	0
Practical Hours	3



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Brief Course Description:

- ❖ Practicing on Assembly disassembling and testing of the main component of the electro-hydraulic systems used in artillery for controlling the movement of the turret and cannon

Course Objectives:

1. The capability to know and distinguish the hydraulic and pneumatic components and parts of the power pack, traverse, recoil, stabilization, protection systems and gun systems for the following M109A3 and M110 A2.
2. Disassembly reassembly and repair of the assemblies and groups in (Paragraph 1).
3. The capability to adjust and calibrate the Electro-Hydraulic systems to perform the preventive maintenance procedure to the systems.
4. Bearing in mind all industrial and personal safety Measures



Detailed Course Description:

Unit Number	Content	Notes	Time Needed
1.	The practical follow up the following hydraulic systems to know the hydraulic power pack system components to know the manual and power elevation system components to know the manual and power traverse system components to know the gun protection systems components to know the Auto loader system components to know the Equilibration system components, to know the recoil spade and hydraulic suspension systems components		
2.	The practical follow up the hydraulic systems and its schematic diagrams. To know the power pack electro-Hydraulic operating circuit and the pressure switch operation, to know the control handles electro Hydraulic circuits, to know the power elevation and traverse electric controls and the operation of the magnetic clutch.		
3.	Disassembly and reassembly of the electro hydraulic groups and practical application on the followings:- Power pack electrical motors and pressure switch, hydraulic reservoir and accumulator, pump, Gage and relieve valve, filter and controls valves, locking valves, elevation cylinder and piston , valve manifold elevation hand pump, , Auxiliary accumulator and control valves recoil Mechanism, Equilibrator accumulators, Buffer and recoil cylinders and variable recoil control system traverse gear box, manual traverse assay and hydraulic motor		

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

	rammer trunnion, rammer cylinder, tray assembly, handle and support, hydraulic suspension, recoil spande and lifting cylinders recoil pistons and cylinders, gun assembly.		
4.	Following up and discovery of the electro hydraulic circuits in the following circuits faults, manual and power elevation circuits faults slip ring electrical circuits faults, loader and rammer power operating circuit faults recoil spade hydraulic circuit faults		
5.	Study and follow electro hydraulic circuit , flutes elevation hydraulic circuits, travers circuit and slepring		
6.	Delay maintenance power pack oil reservoir mechanism valves and cylinders weekly maintenance elevation mechanism, gun assembly rammer assembly, monthly maintenance elevating mechanism travel lock, quarterly maintenance Simi automatic cam, safety switch, Simi annual maintenance, traversing mechanism, oil filter, annual maintenance, hydraulic power pack reservoir, variable recoil mechanism		

Evaluation Strategies:

Exams		Percentage	Date
Exams	Assignments	30%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects			
Discussions and lecture Presentations			

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Teaching Methodology:

- ❖ Laboratory

Text Books & References:

References:

1. Tmer – 7910-34-2-2, US Army.
2. Tmer – 7910-34-2, US Army.
3. TM9 – 2350-275-20-2, US Army.
4. TM9 – 2350 - 253-20 - 2 US Army.
5. TM9 – 1000 – 213 – 3 US Army.
6. TM9 – 2400 – 378 – 35 – 2 – 2 - US Army.
7. Trouble shooting of hydraulic system , prepared by Mustafa Shaban, University of Jordan, Industrial Engineering Department 1993 – 1992.
8. Fluid power handbook, directory by Editors of hydraulic and pneumatics. 1992-1993.
9. Using industrial hydraulics by T.C Franken Enfield.
10. اصول الهيدروليكا الهندسي م.ك ترجمة احمد فيصل اصفري وزارة التعليم العالي . الجمهورية العربية السورية 1977.
11. ميكانيكا الموائع و الهيدروليكا – رينا لدف جاليز . ترجمة الدكتور عمرو محمود صبري . دار ماكجرو هيل للنشر 1981.
12. كراسة م. ابراج طارق بن زياد كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.
13. كراسة م. ابراج الدبابة م. 1.أ.6 و م. 3أ6 كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.
14. كراسة م. ابراج الدبابة م. 109 . م 110 كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية





Engineering Program

Specialty	Electro- Hydraulic Systems
Course Number	20311213
Course Title	Electro – Hydraulic Systems 2
Credit Hours	3
Theoretical Hours	3
Practical Hours	0



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Brief Course Description:

- ❖ Practicing on, assembling disassembling and testing on the main component of the electro hydraulic system used in tanks for controlling the movement of the torrent and cannon

Course Objectives:

The capability to know of the distinguish the electro hydraulic or pinup tic components of the power pack traverse, mechanism elevation mesh recoil mechanism stabilization , mechanism of disk clearance system, gun system for the M60 A1,M60A3, Tareq Of Khaled tanks, disassembly, reassembly of the systems, groups of the system above.

The capability to adjust of the calibrate the electro hydraulic to perform the preventive maintenance required considering the application of safety and projective principles



Detailed Course Description:

Unit Number	Content	Notes	Time Needed
1.	The practical flow of the following hydraulic system to know the	<ul style="list-style-type: none"> ▪ power pack hydraulic components ▪ The manual and power elevation hydraulic components ▪ The manual and power traversing system components ▪ The disk clearance valve components ▪ The super elevation system components ▪ The equilibrator system components 	
2.	The practical follow of the hydraulic system diagrams, to know the	<ul style="list-style-type: none"> ▪ Hydraulic power pack and pressure switch components of principle of operation and circuits ▪ The commander and gunner control handles components and circuits ▪ The stabilization system circuit components ▪ The operating circuits and electrical control of the power traversing elevation and the maintenance break 	
3.	Disassembly and reassembly of the elector hydraulic components the practical application on the following systems	<ul style="list-style-type: none"> ▪ Power pack motor and pressure switch, hydraulic reservoir accumulator, relive valve, pressure gage hydraulic pump, oil filter of control valves ▪ Locking valves elevation cylinder, the piston, oil manavoilt elevation pump, auxiliary accumulator, valves in elevation cylinder, equilibrator cylinder, puffer shock absorber recoil system, recoil cylinder manual traversing system of hydraulic motor and gear box ▪ Auto rammer trunnion or axles of its cylinders loading try, handle and 	

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

		<p>support</p> <ul style="list-style-type: none"> ▪ Elevation and traverse servo valves assembly super elevation system ▪ Recoil systems cylinder of piston gun assembly 	
4.	Follow and discover the electro hydraulic faults	<ul style="list-style-type: none"> ▪ Hydraulic power pack operating circuit faults ▪ Manual and power elevation operating circute faults super elevation operating circuits faults ▪ Diss clearance valve operating circuits faults ▪ Stabilization hydraulic system operating circuit faults ▪ Recoil system and auto rammer operating circuits faults ▪ Gun assembly faults. ▪ Manual elector hydraulic traverse circuit faults ▪ Slip ring electric circel faults 	
5.	Adjustment and celebration	<ul style="list-style-type: none"> ▪ Travers back lash and clearance adjustment ▪ Final drive pinion back lash and clearance ▪ Elevation lock valve and relieve valve ▪ Elevation trunnion and back lash system ▪ Elevation of traverse systems draft ▪ Simi Automatic cam adjustment ▪ Parle measurement and elevation of parle life. ▪ Gun and recoil system exercise ▪ Recoil system aeration (pleading). 	
6.	Preventive maintenance	<ul style="list-style-type: none"> ▪ Delay maintenance ▪ Power back oil reservoir, break bore, preach ring, firing mechanism, valves and cylinder 	



		<ul style="list-style-type: none"> ▪ Weekly maintenance ▪ Elevation maintenance, gun assembly, rammer assembly, monthly maintenance ▪ Elevation mechanism bore evacuator, travel lock, recoil mechanism, periscope trunnion latch or lock . ▪ Quarterly maintenance. ▪ Semi automatic cam, gun cradle trunnion bearings, race ring, race ring gear, safety switch. ▪ Semi annual maintenance ▪ Traversing mechanisms, oil filters, variable recoil mechanism, Semi automatic mechanisms ▪ Annual maintenance. ▪ Hydraulic power back reservoir, gun travel lock anti back lash mechanism, variable recoil mechanisms elevation 	
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Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Lectures



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Text Books & References:

References:

1. Tmer – 7910-34-2-2, US Army.
2. Tmer – 7910-34-2, US Army.
3. TM9 – 2350-275-20-2, US Army.
4. TM9 – 2350 - 253-20 - 2 US Army.
5. TM9 – 1000 – 213 – 3 US Army.
6. TM9 – 2400 – 378 – 35 – 2 – 2 - US Army.
7. Trouble shooting of hydraulic system , prepared by Mustafa Shaban, University of Jordan, Industrial Engineering Department 1993 – 1992.
8. Fluid power handbook, directory by Editors of hydraulic and pneumatics. 1992-1993.
9. Using industrial hydraulics
10. ics by T.C Franken Enfield.
11. اصول الهيدروليك الهندسي م.ك ترجمة احمد فيصل اصفري وزارة التعليم العالي . الجمهورية العربية السورية 1977.
12. ميكانيكا الموائع و الهيدروليكا – رينا لدف جاليز . ترجمة الدكتور عمرو محمود صبري . دار ماكجرو هيل للنشر 1981.
13. كراسة م.ابراج طارق بن زياد كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.
14. كراسة م.ابراج الدبابة م.1.أ.6 و م.3أ6 كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.
15. كراسة م.ابراج الدبابة م109 . م110 كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية



Engineering Program

Specialty	Electro – Hydraulic System
Course Number	20311214
Course Title	Electro – Hydraulic System 2 Workshops
Credit Hours	2
Theoretical Hours	0
Practical Hours	6



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Brief Course Description:

- ❖ Practicing on assembling disassembling and testing of the main component of the electro – hydraulic systems in tanks for controlling the movement of the turret and cannon

Course Objectives:

The capability to know destination the electro – hydraulic or pneumatic component of the power pack , traverse mechanism of deck clearance system , gun system for the M60A1 ,M60A3 , Tariq and Khalid tanks .

Disassembly, Re assembly of the system and group of the system above.

The capability to adjust of calibrate the electro – hydraulic to perform the preventive maintenance enquired considering the application of safety and protective principles



Detailed Course Description:

Unit Number	Content	Notes	Time Needed
1.	The practical follow of the follow hydraulic system	<ul style="list-style-type: none"> ▪ To know the power pack hydraulic components. ▪ To know the manual and power elevation hydraulic components . ▪ To know the deck clearance valve components. ▪ To know the super elevation system components. ▪ To know the auto loader system components . ▪ To know the equilibrator system components . 	
2.	The practical follow of hydraulic system diagrams	<ul style="list-style-type: none"> ▪ To know the hydraulic power pack , pressure switch components of principle of operation . circuits . ▪ To know the commander and gunner control handles components and circuit. ▪ To know the stabilization system circuit components. ▪ To know the operation circuits and electrical control of the power traversing and elevation and the mantic brake. 	
3.	Disassembly af reassembly of the electro- hydraulic system components. the practical application on the following systems	<ul style="list-style-type: none"> ▪ Disassembly af reassembly of the electro- hydraulic system components. the practical application on the following systems . ▪ Power pack electric motor pressure switch hydraulic reservoir, calculator, relief valng pressure gauge , hydraulic pump , oil filter control valves . ▪ Locking valves , elevation cylinoer , the piston , oil manifold elevation pump,auxiliary accumulator , valves in 	

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

		<p>elevating cylinder , equllibrator cylinder , buffer cshock absorber recoil systeb , recoil cylinders manual traversing system hydraulic motorgear box .</p> <ul style="list-style-type: none"> ▪ Auto rammer trunnion or axle its cylinders loading tray , handle support . ▪ Elevation travers servo valves assembly super Elevation system . ▪ Recoil system cylinders pistons gun assembly . 	
4.	<p>Follow discover the electro hydraulic circuit faults hydraulic power pack operating circuit faults super elevation operating circuit faults</p>	<ul style="list-style-type: none"> ▪ Follow discover the electro hydraulic circuit faults hydraulic power pack operating circuit faults super elevation operating circuit faults . ▪ Deck elevance valve operating circuit faults stabilization hydraulic system operating circuit faults recoil system and auto rammer operating circuit 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	Assignments	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects			
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Laboratory



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Text Books & References:

References:

1. Tmer – 7910-34-2-2, US Army.
2. Tmer – 7910-34-2, US Army.
3. TM9 – 2350-275-20-2, US Army.
4. TM9 – 2350 - 253-20 - 2 US Army.
5. TM9 – 1000 – 213 – 3 US Army.
6. TM9 – 2400 – 378 – 35 – 2 – 2 - US Army.
7. Trouble shooting of hydraulic system , prepared by Mustafa Shaban, University of Jordan, Industrial Engineering Department 1993 – 1992.
8. Fluid power handbook, directory by Editors of hydraulic and pneumatics. 1992-1993.
9. Using industrial hydraulics
10. hydraulics by T.C Franken Enfield.
11. اصول الهيدروليك الهندسي م.ك ترجمة احمد فيصل اصفري وزارة التعليم العالي . الجمهورية العربية السورية 1977.
12. ميكانيكا الموائع و الهيدروليكا – رينا لدف جاليز . ترجمة الدكتور عمرو محمود صبري . دار ماكجرو هيل للنشر 1981.
13. كراسة م. ابراج طارق بن زياد كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.
14. كراسة م. ابراج الدبابة م. 1.أ.6 و م. 3أ6 كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.
15. كراسة م. ابراج الدبابة م 109 . م 110 كلية طلية الامير الحسين بن عبدالله الفنية العسكرية القوات المسلحة الاردنية.





Engineering Program

Specialty	Electro- Hydraulic Systems
Course Number	20311217
Course name	Troubleshooting of Hydraulic systems
Credit Hours	3
Theoretical Hours	3
Practical Hours	0



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Brief Course Description:

- ❖ Basic and troubles hooting of hydraulic system , symbols and circuited and components pumps , oils , valves , actuators , filters , reservoirs , tubing , accumulators , circuits hydraulic systems

Course Objectives:

Upon the completion of the course, the student will be able to:

1. Introduction of hydraulic system.
2. Define and discuss pumps ,oils , valves , actuators , filters and circuits hydraulic system



Detailed Course Description

Unit. Number	Content	Notes	Time Needed
1.	Introduction , Definitions , Advantages Disadvantage tags of hydraulic system Applications of hydraulic systems		
2.	Reservoir (Oil tank)		
3.	Hydraulic pumps. pomp class reaction an Applications of different types of pumps		
4.	Hydraulic Oils. Oil properties , Technical specifications , Fluid storage		
5.	Hydraulic Valves. cheek valves , flow control valves , Directional control valves , Solenoid for directional control vales , pressure control valves		
6.	Hydraulic Actuators. Hydraulic cylinders , Hydraulic Motors		
7.	Effect of dirt on hydraulic compounds. Types of contamination , Tasks of hydraulic Fillers. Characteristics of filter elements , Degree of separation		
8.	Oil coolers :Cooling methods ,Types of heat Exchangers , Selection of heat Exchangers		
9.	Hydraulic power lines .Basic requirements , Material of fluid lines hose installation , pipes fittings Connectors		
10.	Hydraulic Accumulators. Types of accumulators , charging of accumulators applications of accumulators		
11.	Seals of fluid power equipment. Dynamic seal applications , static seal application checking for leaks		
12.	Hydraulic circuits. circuits design , Examples of Hydraulic control circuits		
13.	Pneumatic systems. Types of compressor , valves , tanker , circuits pneumatic systems		

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Lectures

References:

1. Amatol: lab Manvel's on hydraulic.
2. Alto's General catalog: 19995.
3. Bosch "Hydraulic in theory and practice "1995.
4. Fest Didactic "Hydraulics Basic Level Course" 1990.
5. He hn , Anton H ."Fluid power Troubleshooting" . MARCEL DEKKER INC .1995

6. كراسة أساسيات تشخيص الأعطال الهيدروليكية .



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



Engineering Program

Specialty	Electro – Hydraulic System
Course Number	20311218
Course Title	Troubleshooting of hydraulic systems workshops
Credit Hours	2
Theoretical Hours	0
Practical Hours	6



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

Brief Course Description:

- ❖ Practing on the hydraulic systems recognizing and disassembling: pumps, actuator, filter, control valves, pressure valves, flow metering valves

Course Objectives:

Upon the completion of the course, the student will be able to:

1. Introduction of hydraulic system
2. Define and discuss pumps ,oils , valves , actuators , filters and circuits hydraulic system

Detailed Course Description:

Unit Number	Content	Unite content	Time Needed
1.	Practing on the hydraulic systems . and application of hydraulic system		
2.	Practing on the hydraulic systems oil tank and hydraulic pump		
3.	Practing on the hydraulic system hydraulic oils and valves		
4.	Practing on the hydraulic system actuators. Fliters, power lines, accumulators. Seals		
5.	Practing on the hydraulic system circuits, pneumatic system.		

Evaluation Strategies:

Exams		Percentage	Date
Exams	Assignments	30%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects			
Discussions and lecture Presentations			

Teaching Methodology:

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



❖ Laboratory

Text Books & References:

1. Amatol lab Manvel's on hydraulic.
2. Alto's General catalog: 19995.
3. Bosch "Hydraulic in theory and practice "1995.
4. Fest Didactic "Hydraulics Basic Level Course" 1990.
5. He hn , Anton H ."Fluid power Troubleshooting". MARCEL DEKKER INC .1995
6. كراسة أساسيات تشخيص الأعطال الهيدروليكية .



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



Engineering Program

Specialty	Electro- Hydraulic Systems
Course Number	20311291
Course name	Training
Credit Hours	3
Theoretical Hours	0
Practical Hours	140



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



Brief Course Description:

- ❖ Equivalent to 140 hours of field training targeted to emphasize the ability of student to apply the Theory in the real world of the profession

Course Objectives:



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



Engineering Program

Specialty	Electro- Hydraulic Systems
Course Number	20311292
Course name	Project
Credit Hours	3
Theoretical Hours	0
Practical Hours	9



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



Brief Course Description:

- ❖ An integrated design project to practice the principles of analysis and design acquired throughout the course of the students study

Course Objectives:



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008