

Electronic Engineering

Specialty	Autotronics of Heavv Vehicles
Course Number	20402211
Course Title	Heavv Vehicles Hull Electrical Svstems
Credit Hours	3
Theoretical Hours	3
Practical Hours	0



Brief Course Description:

- ❖ It is a full understanding of all the electrical systems used in Heavy Vehicles. Main and Generating Engine Starter Systems , Power Distribution , Charging System , Driver Instrument Panel Indicating & Warning Lights – Fuel Pumps – Fuel Cut – off Solenoid – Fuel Gauge , Engine Management System , Pump Mounted Equipment , Inlet Manifold Heater , Main Engine Control Unit

Course Objectives:

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

1. The student must be able to apply the safety regulations when working with Hull Electrical Systems.
2. To enable the student to interpret faults correctly when fault finding.
3. The student will be taught and must be able to understand the purpose, function and operation of the Hull Electrical Systems.
4. To enable the student to realize that the main engine control circuit work under two conditions, electrically controlled and computer controlled.
5. To enable the student to appreciate the reason for the different sub- systems and how they are integrated



Detailed Course Description:

unit Number	unit name	unit content	Time Needed
1.	Power Distribution System	<ul style="list-style-type: none"> ▪ Battery characters ▪ Batteries connections ▪ Harness and cables ▪ Plugs and sockets ▪ Junction Boxes 	
2.	Main and Generating Engine starter systems	<ul style="list-style-type: none"> ▪ Wire diagram ▪ Main Assemblies Connection and Function ▪ Starter components 	
3.	Charging system	<ul style="list-style-type: none"> ▪ Wire diagram ▪ Main Assemblies Function and connection ▪ Generator components 	
4.	Driver's Instrument Panel	<ul style="list-style-type: none"> ▪ Indicating and warning lights ▪ Lights panel ▪ Lighting system ▪ Main headlamps and tail-lamps 	
5.	Fuel pumps	<ul style="list-style-type: none"> ▪ Fuel pumps ▪ Fuel cutoff solenoid ▪ Fuel gauge 	
6.	Engine management system	<ul style="list-style-type: none"> ▪ Pump Mounted Equipment ▪ Inlet Manifold Heater ▪ Main Engine Control Unit ▪ Fuel Pedal Transducer 	
7.	Gear selection system	<ul style="list-style-type: none"> ▪ Gear Box Solenoids ▪ Gear Box Micro switches ▪ Gear Layout ▪ Gear Control Box 	

Evaluation Strategies:

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

Teaching Methodology:

- ❖ Lecture

Text Books & References:

Textbook:

- 1 كراسه الأنظمة الكهربائية لهياكل الآليات الثقيلة ، إعداد : المهندس : صلاح مصلح المعاني كلية الأمير الحسين بن عبدالله الفنية العسكرية

References:

1. US ARMY, TM9-2350-253-20
2. USA, US ARMY, 2001
3. US ARMY, TM9-2350-253-10, USA, US ARMY, 2000
4. US ARMY, TM9-2350.217.10, USA, US ARMY, 1999
5. US ARMY, TM9-2350-304-10, USA, US ARMY, 1999
6. US ARMY, TM9-2350-217-20, USA, US ARMY, 1998
7. UK ARMY, ELECTRONIC PUBLICATIONS EMERS, UK, UK ARMY, 1999



Electronic Engineering

Specialty	Autotronics of Heavy Vehicles
Course Number	20402212
Course Title	Heavy Vehicles Hull Electrical Systems Workshops
Credit Hours	2
Theoretical Hours	0
Practical Hours	6



Brief Course Description:

- ❖ Fault finding practical exercises on all electrical systems using related schematic diagrams besides practical application for all subjects studied theoretically

Course Objectives:

At the end of this course, students will be able to:

1. Charging system and starter systems.
2. Testing, troubleshooting and fault diagnosis procedures.
3. Reading schematic and block diagrams of various systems.
4. To be familiar with components location and connections.
5. Equipment inspection procedure.
6. Remove / replace of all electronic equipment.
7. Regular maintenance procedure



Detailed Course Description:

Unit Number	Unit name	Unite content	Time Needed
1.	Power distribution	<ul style="list-style-type: none"> ▪ Battery removal and replacement ▪ Cables and Harness identification ▪ Sockets and plugs removal and tests 	
2.	Main and Generating Engine starter systems	<ul style="list-style-type: none"> ▪ Checks and maintenance ▪ Starter assembling and disassembling ▪ Fault finding procedure 	
3.	Charging system	<ul style="list-style-type: none"> ▪ Checks and maintenance ▪ Generator assembling and disassembling ▪ Charging warning light circuit check ▪ Fault finding procedure 	
4.	Driver's Instrument Panel	<ul style="list-style-type: none"> ▪ Indicating and warning Lights check-up ▪ Lighting system test and adjustment ▪ Light panel removal and replacement 	
5.	Fuel pumps	<ul style="list-style-type: none"> ▪ Check- up and adjustment ▪ Removal and replacement ▪ Fault finding and practical application 	
6.	Engine management system	<ul style="list-style-type: none"> ▪ Fault finding practical exercises o on first line test set operation ▪ Main engine control unit testing and fault diagnosis procedures 	
7.	Gear selection system	<ul style="list-style-type: none"> ▪ First line test set ▪ Testing and fault diagnosis procedures 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	Assignments	40%	--/--/----
	Mid-tern exam	20%	--/--/----
	Final practical exam	40%	--/--/----
Homework and Projects			
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Laboratory

Text Books & References:

Textbook:

1. كراسه الأنظمة الكهربائية لهياكل الآليات الثقيلة ، إعداد : المهندس : صلاح مصلح المعاني كلية الأمير الحسين بن عبدالله الفنية العسكرية

References:

1. US ARMY, TM9-2350-253-20, USA, US ARMY, 2001
2. US ARMY, TM9-2350-253-10, USA, US ARMY, 2000
3. US ARMY, TM9-2350.217.10, USA, US ARMY, 1999
4. US ARMY, TM9-2350-304-10, USA, US ARMY, 1999
5. US ARMY, TM9-2350-217-20, USA, US ARMY, 1998
6. UK ARMY, ELECTRONIC PUBLICATIONS EMERS, UK, UK ARMY, 1999



Electronic Engineering

Specialty	Autotronics of Heavy Vehicles
Course Number	20402221
Course Title	Heavy Vehicles Turrets Electronic Systems
Credit Hours	3
Theoretical Hours	3
Practical Hours	0



Brief Course Description:

- ❖ Thorough Study for the Functions, Operation and also The Purpose Of The Turret Electronic Systems: Computer Interface Unit, Data Handling Sub-System, Fire Control System, The Sensor Sub-System, The Sight Sub-System , Gun Control Equipment , Thermal Observation Gunnery Sight

Course Objectives:

At the end of this course, students will be able to:

1. To teach the student about the factors affecting ballistic calculations including types of ammunition and their characteristics.
2. To teach the student the controls and indications used with Improved Fire Control System.
3. To enable the student to appreciate the reason for the different sub-systems and how they are integrated.
4. To understand how all the information used in ballistic calculations is attained.
5. To enable the student to interpret faults correctly when fault finding.
6. To teach the student the role of the Thermal Observation Gunnery System and a brief insight into Thermal Imagery



Detailed Course Description:

unit number	unit name	unit content	Time Needed
.1	Data Handling Sub system	<ul style="list-style-type: none"> ▪ Low pass filter unit ▪ Commander control and monitor unit ▪ Computer interface unit ▪ Signal interconnections ▪ Control Data ▪ Display Data ▪ Power supply distribution ▪ System protection 	
.2	Tank laser sight	<ul style="list-style-type: none"> ▪ Aiming mark electronic unit ▪ Power supply distribution ▪ Ellipse generation 	
.3	Sensor Subsystem	<ul style="list-style-type: none"> ▪ Meteorological data ▪ Sensor vehicle moving ▪ Gun elevation displacement unit ▪ Turret displacement unit ▪ Trunion tilt and sight unit 	
.4	Gun Control Equipment	<ul style="list-style-type: none"> ▪ Gyro ▪ Traverse motor ▪ Elevation motor ▪ Control units 	
5.	Thermal Observation Gunnery Sight	<ul style="list-style-type: none"> ▪ Safety precautions ▪ Coolant supply unit ▪ Thermal imager sensor head ▪ Commander display unit ▪ Gunners display unit ▪ Detectors 	



Evaluation Strategies:

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

Teaching Methodology:

- ❖ lecture

Text Books & References:

Textbook:

1. كراسه النظم الإلكترونية لأبراج الآليات الثقيلة، إعداد المهندس: صلاح مصلح المعاني كلية الأمير الحسين بن عبدالله الفنية العسكرية.

References:

1. UK ARMY, Turret systems inspection standard army, UK, UK ARMY, 2001
2. UK ARMY, TANK LAZER SIGHT NO. 10, UK, UK ARMY, 2000
3. UK ARMY, TANK LAZER SIGHT NO. 10 Basic Course, UK, UK ARMY, 1999
4. UK ARMY, LAZER PSU NO.1 MK2, UK, UK ARMY, 1999
5. UK ARMY, THERMAL IMAGING, UK, UK ARMY, 1998



Electronic Engineering

Specialty	Autotronics of Heavy Vehicles
Course Number	20402222
Course Title	Heavy Vehicles Turrets Electronic Systems Workshons
Credit Hours	2
Theoretical Hours	0
Practical Hours	6



Brief Course Description:

- ❖ Systematic fault finding and troubleshooting, practical application for all subjects studied theoretically

Course Objectives:

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

1. To study the related electronic circuits: Identification and Location of Components and Setup Operation.
2. Technique for Removal and Replacement of main components.
3. Introduction to the Main Battle tank fighting capabilities.
4. To apply safety precautions and pre start checks.
5. Equipment Inspection and adjustment procedure.
6. Fault finding pra/+*/++ctical exercises on fire control system.
7. Regular maintenance procedure



Detailed Course Description:

Unit Number	Unit name	Unit content	Time Needed
1.	Data Handling Subsystem	<ul style="list-style-type: none"> ▪ Computer Interface Unit Tests and adjustments ▪ Safety Precautions and Pre-Start checks ▪ Start-up Procedure Fault finding and diagnosis 	
2.	Tank Laser Sight	<ul style="list-style-type: none"> ▪ Range Finder Tests and adjustments ▪ Carry out functioning checks ▪ Start Up procedure ▪ Technique for removal and replacement of laser system components 	
3.	Sensor Sub-system	<ul style="list-style-type: none"> ▪ Main Probe tests and adjustments ▪ Identify Components, Remove and Refit ▪ Inspect and rectify faults 	
4.	Gun Control Equipment	<ul style="list-style-type: none"> ▪ Equipment Inspection Procedure ▪ Test and adjustment Gun Equipment ▪ Carry out Servicing and test operation ▪ Fault Finding, Refit and function test 	
5.	Thermal Observation Gurnery Sight	<ul style="list-style-type: none"> ▪ Equipment Inspection Procedure ▪ Thermal sensor head Removal and Replacement ▪ Test and adjustment thermal system ▪ Procedure for thermal image preparation and operation system 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	Assignments	40%	--/--/----
	Mid-tern exam	20%	--/--/----
	Final practical exam	40%	--/--/----
Homework and Projects			
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Laboratory

Text Books & References:

Textbook:

1. كراسه مشغل النظم الإلكترونية لأبراج الآليات الثقيلة، إعداد المهندس: صلاح مصلح المعاني كلية الأمير الحسين بن عبدالله الفنية العسكرية.

References:

1. UK ARMY Turret systems inspection standard army UK UK ARMY ,2001
2. UK ARMY TANK LAZER SIGHT NO. 10 UK UK ARMY 2000
3. UK ARMY TANK LAZER SIGHT NO. 10 Basic Course UK UK ARMY 1999
4. UK ARMY LAZER PSU NO.1 MK2 UK UK ARMY 1999
5. UK ARMY THERMAL IMAGING UK UK ARMY 1998



Electronic Engineering

Specialty	Autotronics of Heavy Vehicles
Course Number	20402231
Course Title	Special Electronic Equipment
Credit Hours	3
Theoretical Hours	3
Practical Hours	0



Brief Course Description:

- ❖ Typical various electronic equipment, Artillery target acquisition system, night vision sight, laser range finder, LP6 navigation systems (pads) ceraco radar, progetile velocity measurement Milcam and Ranger systems

Course Objectives:

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

1. Study of all main assemblies and subassemblies block diagrams and layouts related to artillery fire control adjustments
2. Artillery tactical terminal (ATT) functions and operation procedures
3. Fault finding and practical exercises on (ATT) laser range finder and thermal equipment
4. To understand the general principles of fire control system related to the artillery equipment
5. Inspection procedure using relevant schematic diagrams



Detailed Course Description:

Unit Number	Unit name	Unit content	Time Needed
1.	Regiment artillery computer	<ul style="list-style-type: none"> ▪ Power supply unit ▪ Auxillary power unit ▪ Printers ▪ Computer interface unit 	
2.	Battery artillery computer	<ul style="list-style-type: none"> ▪ Power supply unit ▪ Computer interface unit ▪ Junction boxes ▪ Interconnection cables 	
3.	Navigation system	<ul style="list-style-type: none"> ▪ Navigation unit ▪ Display unit ▪ Artillery Tactical Terminal (ATT) ▪ Ceraco unit 	
4.	Thermal systems	<ul style="list-style-type: none"> ▪ Thermal image sensor head ▪ Detectors ▪ Coolant unit ▪ Power supply unit 	
5.	Laser systems	<ul style="list-style-type: none"> ▪ Transmitter unit ▪ Receiver unit ▪ Power supply unit ▪ Laser training equipment ▪ Lp6 range finder 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Assignments	10%	--/--/----
	Final Exam	50%	--/--/----
Distributed equally on all practical experiments and assignments			

Teaching Methodology:

- ❖ Lecture

Text Books & References:

Textbook:

1. كراسه المعدات والاجهزة الخاصة
2. كراسة المعدات الحرارية إعداد : الطاقم التدريبي في كلية الأمير الحسين بن عبدالله الفنية العسكرية

References:

1. UK ARMY, Lazer Technology, UK ; UK ARMY 1999
2. US ARMYk, TM9-2350-259-34 ,USA; US ARMY ،2000
3. US ARMY, Test set pure air hymatic, USA, US ARMY, 2001
4. الدكتور المهندس رزق محمود ابوعلان، مبادئ الرادار، عمان، مركز الخدمات الإلكترونية والتدريب 2000
5. كلية الأمير الحسين بن عبدالله الفنية العسكرية: مبادئ الرادار ، كلية الأمير الحسين بن عبدالله الفنية العسكرية 2002



Electronic Engineering

Specialty	Autotronics of Heavy Vehicles
Course Number	20402232
Course Title	Special Electronic Equipment workshons
Credit Hours	1
Theoretical Hours	0
Practical Hours	3



Brief Course Description:

- ❖ Adjustment and calibration for the related systems in addition to practical application on all subjects studied theoretically

Course Objectives:

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

1. Testing and fault diagnosis procedures for artillery fire control system
2. To study the layouts of main assemblies and subassemblies
3. Identification of main components location and operation
4. Removal and Replacement of main assemblies and subassemblies
5. Systematic troubleshooting using schematic diagrams
6. Adjustment and calibration procedures for navigation systems



Detailed Course Description:

Unit Number	Unit name	Unit content	Time Needed
1.	Regiment artillery computer.	<ul style="list-style-type: none"> ▪ Computer unit tests and adjustments ▪ Start-up procedure ▪ Fault finding and diagnosis ▪ Removal and Replacement (Main assemblies and Subassemblies) 	
2.	Battery artillery computer	<ul style="list-style-type: none"> ▪ Power supply unit checkup ▪ Computer interface unit test and operation ▪ Fault finding and diagnosis ▪ Removal and replacement (main assemblies and sub assemblies) 	
3.	Navigation system	<ul style="list-style-type: none"> ▪ Navigation unit test and operation ▪ Main parts removal and replacement ▪ SERACO unit test and operation ▪ Fault finding and diagnosis 	
4.	Thermal systems	<ul style="list-style-type: none"> ▪ Main system units' removal and replacement ▪ Systems operation and malfunctions ▪ Fault finding and practical application ▪ Schematic diagrams and flowcharts 	
5.	Laser systems	<ul style="list-style-type: none"> ▪ Transmitter unit fault diagnosis ▪ Receiver unit fault diagnosis ▪ Power supply unit removal and replacement ▪ LP6 range finder operation and Common malfunctions and remedies 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	Assignments	30%	--/--/----
	Mid-tern exam	20%	--/--/----
	Final practical exam	50%	--/--/----
Homework and Projects			
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Laboratory

Text Books & References:

Textbook:

1. كراسه مشغل المعدات والاجهزة الخاصة
2. كراسة مشغل المعدات الحرارية إعداد : الطاقم التدريبي في كلية الأمير الحسين بن عبدالله الفنية العسكرية

References:

1. UK ARMY, Lazer Technology, UK, UK ARMY, 1999
2. US ARMY, TM9-2350-259-34, USA, US ARMY, 2000
3. الدكتور المهندس رزق محمود ابوعلان, مبادئ الرادار, عمان, مركز الخدمات الإلكترونية و التدريب, 2000
4. كلية الأمير الحسين بن عبد الله الفنية العسكرية, مبادئ الرادار, كلية الأمير الحسين بن عبدالله الفنية العسكرية 2002
5. US ARMY, Test set pure air hynamic, USA, US ARMY, 2001



Electronic Engineering

Specialty	Autotronics of Heavy Vehicles
Course Number	20402213
Course Title	Automotive Electrical Systems
Credit Hours	3
Theoretical Hours	3
Practical Hours	0



Brief Course Description:

- ❖ Basic electricity and electronics, automotive batteries, starting system fundamentals, charging system fundamentals, ignition system fundamentals. Light wipers, horn fundamentals, heating and air conditioning fundamentals, radios, power options

Course Objectives:

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

1. The student must be able to apply the safety regulations when working with Automotive Electrical Systems.
2. To enable the student to interpret faults correctly when fault finding.
3. The student will be taught and must be able to understand the purpose, function and operation of the Automotive Electrical Systems.
4. To enable the student to realize that the engine functions control circuit work under two conditions, electrically controlled and computer controlled.
5. To enable the student to appreciate the reason for the different sub- systems and how they are integrated



Detailed Course Description:

Unit Number	Unit name	Unit content	Time Needed
1.	Electrical systems of engine component	<ul style="list-style-type: none"> ▪ Circuits and devices that are usually situated under the bonnet of the engine compartment such as : <ul style="list-style-type: none"> - Battery - Alternator - Starting engine - Electrical fan - Radiator and digital ignition system. 	
2.	Battery diagnosis and service	<ul style="list-style-type: none"> ▪ Battery state of charge ▪ Battery capacity ▪ Load and high rate discharge ▪ Battery cables, connectors, clamps 	
3.	Starting system:	<ul style="list-style-type: none"> ▪ Starter ▪ Starter motor ▪ Starter current and circuit voltage drop ▪ Starter relays and solenoids 	
4.	Charging system	<ul style="list-style-type: none"> ▪ Theory of operation ▪ AC Generator construction ▪ DC Rectification ▪ Field circuits ▪ Electronic regulators ▪ Charging, undercharging, no charging and overcharging conditions 	
5.	Electrical lighting systems and signaling	<ul style="list-style-type: none"> ▪ Circuits and devices that are used as a rule for lighting and typical signaling in cars 	
6.	Car air- conditioning system:	<ul style="list-style-type: none"> ▪ Typical conditioning system of ON – OFF type for cars ▪ Automatic air- conditioning ▪ Electronic managing controls of an advanced air- conditioning system for cars 	
7.	Electrical systems for auxiliary devices	<ul style="list-style-type: none"> ▪ Electrical systems used for the following auxiliary devices <ul style="list-style-type: none"> ▪ Rear window wiper ▪ Rear window washer ▪ Digital clock ▪ Car radio equipped with cassette copier and compact disk ▪ Lighter, centralized locking ▪ Electrically controlled window winder ▪ Electronic thief-proof device, cell phone 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Assignments	10%	--/--/----
	Final Exam	50%	--/--/----
Distributed equally on all practical experiments and assignments			

Teaching Methodology:

- ❖ Lecture

Text Books & References:

Textbook:

1. Automotive Electricity and Electronic, BARRY HOLLENBEAK Delmer publisher; Shop manual for automotive electricity and electronic

References:

1. مهندس عاطف منصور، كهرباء سيارات، القاهرة، الأيمان 1999
2. الدكتور المهندس خالد طشطوش، صيانة الاليات، كلية الأمير الحسين بن عبد الله الفنية العسكرية، 2000
3. William B. Ribbens., Understanding automotive electronics, UK, heinemann, 2000
4. كلية الأمير الحسين بن عبد الله الفنية العسكرية، Fuel injection system، كلية الأمير الحسين بن عبد الله الفنية العسكرية 2002،
5. كلية الأمير الحسين بن عبد الله الفنية العسكرية، النظم الكهربائية، كلية الأمير الحسين بن عبد الله الفنية العسكرية 2001



Electronic Engineering

Specialty	Autotronics of Heavy Vehicles
Course Number	20402214
Course Title	Automotive Electrical Systems Workshons
Credit Hours	1
Theoretical Hours	0
Practical Hours	3



Brief Course Description:

- ❖ Battery testing and servicing, starting system testing and repair charging system diagnosis testing, repair, ignition system problems testing and repair, heating and condition service

Course Objectives:

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

1. Charging system and starter systems.
2. Testing, troubleshooting and fault diagnosis procedures.
3. Reading schematic and block diagrams of various systems.
4. To be familiar with components location and connections.
5. Equipment inspection procedure.
6. Remove / replace of all electronic equipment.
7. Rregular maintenance procedure



Detailed Course Description:

Unit Number	Unit name	Unit content	Time Needed
1.	Battery diagnosis and service	<ul style="list-style-type: none"> ▪ Perform battery state of charge test ▪ Battery capacity test ▪ Clean and insert battery cables, connectors, clamps and hold downs 	
2.	Starting system diagnosis and repair	<ul style="list-style-type: none"> ▪ Inspect and test starter relays and solenoids ▪ Remove and replace starter motor ▪ Perform starter free running 	
3.	Charging system diagnosis and repair	<ul style="list-style-type: none"> ▪ Diagnosis causes of undercharging, no charging, and overcharging conditions ▪ Inspect, replace and adjust alternator drive belts ▪ Remove, inspect and replace alternator 	
4.	Lighting and signaling electrical systems diagnosis and repair	<ul style="list-style-type: none"> ▪ Survey of lighting and signaling systems related to ▪ Side lights, direction indicators, emergency and reverse lights, red read light ▪ Stop light and inside lighting system, low beam and high beam headlights, and hooter ▪ Windscreen wiper windscreen washer, rear window electrical system. ▪ Fuel level gauge, inside ventilation, cooling liquid temperature gauge, dashboard pilot lamps ▪ Survey of anomalies, malfunctioning and breakdowns with conventional instruments 	
5.	Air conditioning systems diagnosis and repair	<ul style="list-style-type: none"> ▪ Survey of refrigerating system parts: compressor, condenser, evaporator, command and control devices ▪ Survey of refrigerating cycle ▪ Survey of refrigerating –cycle variations according to car speed variation ▪ Survey of system efficiency and check on relevant exchange coefficients ▪ Thermal balances and performances ▪ Gas emptying and charging operations and system calibration ▪ Survey of anomalies, malfunctioning and breakdowns with adequate instruments 	

		<ul style="list-style-type: none"> ▪ Automatic air conditioning ▪ Survey of cool – air system operation: connection and disconnection and disconnection conditions of compressor and electrical fan with respect to condenser ▪ Survey of air conditioning unit manual operation: setting of desired inside temperature and of electrical fan speed choice of air –blow distribution inside the driver's cabin, activation of anti – misting, air – recycling and fuel – saving functions ▪ Survey of air-conditioning unit automatic operation depending on: room temperature, outside temperature and mixed-air temperature ▪ Check on air-recycling command according to outside temperature ▪ Check on air-blow direction depending on position of distribution actuator ▪ Check on operating conditions with cold-motor car starting ▪ Check on surge-stress suppression at car starting ▪ Survey of anomalies, malfunctioning and breakdowns with conventional or dedicated diagnostic ▪ Instruments 	
<p>6.</p>	<p>Electrical systems for auxiliary devices diagnosis and repair</p>	<ul style="list-style-type: none"> ▪ Survey of electrical systems used for the following auxiliary devices: rear-window wiper, rear-window washer, digital clock, car radio ▪ Equipped with cassette copier and Compact Disk, lighter, centralized locking, electrically-controlled window winder electronic thief ▪ Proof device, cell phone ▪ Installation and test of a cell phone radio car systems ▪ Survey of anomalies, malfunctioning and breakdowns, troubleshooting procedures with conventional instruments 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	Assignments	30%	--/--/----
	Mid-tern exam	20%	--/--/----
	Final practical exam	50%	--/--/----
Homework and Projects			
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Laboratory

Text Books & References:

Textbook:

1. Automotive Electricity and Electronic; BARRY HOLLEN BEAK Delmer , publisher Shop manual for automotive electricity and electronic

References:

1. مهندس عاطف منصور، كهرباء سيارات، القاهرة، الأيمان 1999،
2. الدكتور المهندس خالد طشطوش، صيانة الاليات، كلية الأمير الحسين بن عبدالله الفنية العسكرية، 2000
3. William B. Ribbens., Understanding automotive electronics, UK, heinemann, 2000
4. كلية الأمير الحسين بن عبدالله الفنية العسكرية، Fuel injection system، كلية الأمير الحسين بن عبدالله الفنية العسكرية 2002،
5. كلية الأمير الحسين بن عبدالله الفنية العسكرية، النظم الكهربائية، كلية الأمير الحسين بن عبدالله الفنية العسكرية 2001،

