

Associate Degree Program

Specialization	Autotronics of Heavy Vehicles
Course Number	٠٢٠٣٠٣٢٣١
Course Title	Heavy Vehicles Turrets Electronic Systems 1
Credit Hours	3
Theoretical Hours	3
Practical Hours	0

Short 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. (**For US Armored vehicles**)

Course Objectives:

By the end of this course students are expected to be able to:

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 Description:

No.	Unit Title	Unit Content	Hours
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 	

No.	Unit Title	Unit Content	Hours
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	

Teaching Methods:

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_ lecture

Books and references:

Textbook:

كراسة النظم الإلكترونية لأبراج الآليات الثقيلة ' إعداد المهندس صلاح مصلح المعاني ،كلية الأمير الحسين بن عبد الله الثاني الفنية العسكرية

References:

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

Associate Degree Program

Specialization	Autotronics of Heavy Vehicles
Course Number	٠٢٠٣٠٣٢٣٢
Course Title	Heavy Vehicles Turrets Electronic Systems Workshops 1
Credit Hours	2
Theoretical Hours	0
Practical Hours	6

Short Description:

Systematic fault finding and troubleshooting, practical application for all subjects studied theoretically (For Us Vehicles)

Course Objectives:

By the end of this course students are expected to be able to:

Upon the completion of the course , the student will be able 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 practical exercises on fire control system.
7. Regular maintenance procedure

Detailed Description:

No.	Unit Title	Unit Content	Hours
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 	

No.	Unit Title	Unit Content	Hours
5	Thermal Observation Gunnery 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	

Teaching Methods:

Laboratory

Books and references:

كراسة مشغل النظم الإلكترونية لأبراج الآليات الثقيلة ' إعداد المهندس صلاح مصلح المعاني ،كلية الأمير الحسين بن عبد الله الثاني الفنية العسكرية

References:

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

Associate Degree Program

Specialization	Autotronics of Heavy Vehicles
Course Number	٠٢٠٣٠٣٢٤١
Course Title	Heavy Vehicles Turrets Electronic Systems 2
Credit Hours	3
Theoretical Hours	3
Practical Hours	0

Short 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. (**For UK Armored vehicles**)

Course Objectives:

By the end of this course students are expected to be able to:

1. Engage in conversation and understand main ideas in complex content
2. Interact with a degree of fluency and spontaneity inside and outside the workplace
3. Formally welcome guests and start small talks, make polite requests and give suggestions
4. Actively participate in meetings, express and justify opinions in addition to meeting minute keeping
5. Plan and deliver presentations and interact with the audience
6. Fluently answer questions related to areas of expertise

Detailed Description:

No.	Unit Title	Unit Content	Hours
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 	3
2	Tank laser sight	<ul style="list-style-type: none"> • Aiming mark electronic unit • Power supply distribution • Ellipse generation 	3
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 	6
4	Gun Control Equipment	<ul style="list-style-type: none"> • Gyro • Traverse motor • Elevation motor • Control units 	2

No.	Unit Title	Unit Content	Hours
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	4
6	Electro hydraulic power system	<ul style="list-style-type: none">• Protection systems• Hydraulic pump• Deviation gear• Altitude gear• Control arms• Electro Hydraulic Sub systems	3

Teaching Methods:

_ lecture

Books and references:

Textbook:

كراسة النظم الإلكترونية لأبراج الآليات الثقيلة ' إعداد المهندس صلاح مصلح المعاني ،كلية الأمير الحسين بن عبد الله الثاني 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

Associate Degree Program

Specialization	Autotronics of Heavy Vehicles
Course Number	٠٢٠٣٠٣٢٤٢
Course Title	Heavy Vehicles Turrets Electronic Systems Workshops 2
Credit Hours	2
Theoretical Hours	0
Practical Hours	6

Short Description:

Systematic fault finding and troubleshooting, practical application for all subjects studied theoretically (For Uk Armored Vehicles)

Course Objectives:

By the end of this course students are expected to be able to:

Upon the completion of the course , the student will be able 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 practical exercises on fire control system.**
- 7. Regular maintenance procedure**

Detailed Description:

No.	Unit Title	Unit Content	Hours
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	<ul style="list-style-type: none"> • Equipment Inspection Procedure • Thermal sensor head Removal and Replacement 	

	Gunnery Sight	<ul style="list-style-type: none">• Test and adjustment thermal system• Procedure for thermal image• preparation and operation system	
6	Electro hydraulic power system	<ul style="list-style-type: none">• Protection systems inspection• Hydraulic pump removal• Deviation gear inspection• Altitude gear inspection• Control arms trouble shooting• Electro Hydraulic Sub systems trouble shooting	

**Teaching Methods:
Laboratory**

Books and references:

كراسة مشغل النظم الإلكترونية لأبراج الآليات الثقيلة ' إعداد المهندس صلاح مصلح المعاني ،كلية الأمير الحسين بن عبد الله الثاني 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 Challenger , UK, UK ARMY, 1999
5. UK ARMY, THERMAL IMAGING, UK, UKARMY, 1998

Associate Degree Program

Specialization	Autotronics of Heavy Vehicles
Course Number	٠٢٠٣٠٣٢٢١
Course Title	Heavy Vehicles Hull Electrical Systems
Credit Hours	3
Theoretical Hours	3
Practical Hours	0

Short 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:

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 Description:

No.	Unit Title	Unit Content	Hours
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 	

		<ul style="list-style-type: none">• Lighting system• Main headlamps and taillamps	
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	

Teaching Methods:

-Lecture

Text Books & References:

Textbook:

كراسة الأنظمة الكهربائية لهياكل الآليات الثقيلة ، إعداد المهندس صلاح مصلح المعاني كلية الأمير الحسين بن عبد الله الثاني 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

Associate Degree Program

Specialization	Autotronics of Heavy Vehicles
Course Number	٠٢٠٣٠٣٢٢٢
Course Title	Heavy Vehicles Hull Electrical Systems workshops
Credit Hours	2
Theoretical Hours	0
Practical Hours	6

Short Description:

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

Course Objectives:

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 Description:

No.	Unit Title	Unit Content	Hours
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 	
		<ul style="list-style-type: none"> • Indicating and warning Lights 	

4	Driver's Instrument Panel	<ul style="list-style-type: none"> • 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 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 	

Teaching Methods:

-Laboratory

Text Books & References:

Textbook:

كراسة الأنظمة الكهربائية لهياكل الآليات الثقيلة ، إعداد المهندس صلاح مصلح المعاني كلية الأمير الحسين بن عبد الله الثاني 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

Associate Degree Program

Specialization	Autotronics of Heavy Vehicles
Course Number	٠٢٠٣٠٣٢٥١
Course Title	Special Electronic Equipment
Credit Hours	3
Theoretical Hours	3
Practical Hours	0

Short Description:

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

Course Objectives:

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 Description:

No.	Unit Title	Unit Content	Hours
1	Regiment artillery computer	<ul style="list-style-type: none"> • Power supply unit • Auxiliary 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 	

		<ul style="list-style-type: none">• 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	

Teaching Methods:

-Lecture

Text Books & References:

Textbook:

١. كراسة المعدات والأجهزة الخاصة
٢. كراسة المعدات الحرارية :- إعداد الطاقم التدريبي في كلية الأمير الحسين بن عبد الله الثاني الفنية العسكرية

References:

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 hynamic, USA, US ARMY, 2001

- ! . الدكتور المهندس رزق محمود أبو علان ، مبادئ الرادار ، عمان ، مركز الخدمات الإلكترونية والتدريب ٢٠٠٠
- ٢ . كلية الأمير الحسين بن عبد الله الثاني الفنية العسكرية ك مبادئ الرادار ، كلية الأمير الحسين بن عبد الله الثاني الفنية العسكرية ٢٠٠٢

Associate Degree Program

Specialization	Autotronics of Heavy Vehicles
Course Number	٠٢٠٣٠٣٢٥٢
Course Title	Special Electronic Equipment workshops
Credit Hours	1
Theoretical Hours	0
Practical Hours	6

Short 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 able 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 Description:

No.	Unit Title	Unit Content	Hours
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 	
		<ul style="list-style-type: none"> • _ Main system units' removal and 	

4	Thermal systems	<ul style="list-style-type: none">• 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	

Teaching Methods:

-Laboratory

Text Books & References:

Textbook:

- ١ . كراسة مشغل المعدات والأجهزة الخاصة
- ٢ . كراسة مشغل المعدات الحرارية :- إعداد الطاقم التدريبي في كلية الأمير الحسين بن عبد الله الثاني 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
- ! . الدكتور المهندس رزق محمود أبو علان ، مبادئ الرادار ، عمان ،مركز الخدمات الإلكترونية والتدريب ٢٠٠٠
- ٢ . كلية الأمير الحسين بن عبد الله الثاني الفنية العسكرية ٢٠٠٢
5. US ARMY, Test set pure air hymatic, USA, US ARMY, 2001