Module(Course Syllabus)Catalogue

2023-2024

College/ Institute	Erbil Technology College	
Department	Automotive Technology Engineering	
Module Name	Automotive Electricity and Electronics	
Module Code	AEE204	
Degree	Technical Diploma [*] Bachelor [ ] High Diploma [ ] Master [ ] PhD [ ]	
Semester	2nd	
Qualification	MSc. In Electrical Engineering	
Scientific Title	Assistant Lecturer	
ECTS (Credits)	5	
Module type	Prerequisite [ ] Core [*] Assist. [ ]	
Weekly hours		
Weekly hours (Theory)	(2)hr Class	(135)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	(135)Total hrs Workload
Number of Weeks	12	
Lecturer (Theory)	Ronak Ahmad Saeed	
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Lecturer (Practical)	Ronak Ahmad Saeed	
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Websites		

Course Book

Course Description	This course covers basic electrical theory, wiring diagrams, test equipment, and diagnosis, repair and replacement of batteries, starters, and alternators. Topics include Ohm's Law, circuit construction, wiring diagrams, circuit testing, and basic troubleshooting. Upon completion, students should be able to properly use wiring diagrams, diagnose, test, and repair basic wiring, battery, starting, charging, and electrical concerns.
Course objectives	Upon completion of this course the student will be able to: 1. Observe and perform safety procedures related to electrical systems 2. Identify vehicle identification numbers, electronic service information, and service repair orders. 3. Methodically approach and diagnosis problems in electrical systems, in order to make a direct, thorough and economical diagnosis. 4. Do basic testing and service on battery, starting, charging, and basic electrical systems 5. Perform basic “in-car” diagnostics and repairs. 6. Understand the basic concepts and procedures to successfully repair late model battery, starting, charging, and basic electrical systems.
Student's obligation	Class attendance is important, and attendance will be taken every lecture. The student submits a weekly report about what have done in the Lab section. For examination, there are semester exam and final exam for the practical and the theory parts. During the class hours there will be some quizzes.
Required Learning Materials	Basics of electricity safety, Tools, Instrumentation and Applications. White board, data show.

Evaluation	**Task**		**Weight (Marks)**	**Due Week**	**Relevant Learning Outcome**
	Paper Review				
	Assignments		5		
			2		
			5		
			5		
	Quiz		8		
	Lab.		10		
	Midterm Exam		25		
	Final Exam		40		
	Total		100		
Specific learning outcome:	1- Upon the completion of this course students will be able to complete the following: 1. Demonstrate work place safety related to transportation electrical systems. 2. Interpret and apply wiring diagram information on a transportation vehicle electrical system. 3. Demonstrate the proper use of electrical diagnostic test equipment. 4. Use Ohm's law to calculate the value of any of the following given the values of the remaining variables: * Voltage (V) * Resistance (R) Directorate of Quality Assurance and Accreditation بوڕیوەبورایوتیدڵنیاییجۆریومتمانوبوخشین * Amperage (A) 5. Given a transportation vehicle with a fault in the battery, starting, and charging system, students will be able to perform successful diagnosis and repairs. 6. Demonstrate the ability to obtain appropriate service information on electrical circuit construction				
Course References:	Hollembeak, B., 2011. Automotive Electricity and Electronics, NY, USA. Martin, T., 2015. Automotive diagnostic Scanners, Quarto Publishing Group, USA. Al Santini, 2013. Automotive Electricity and Electronics, NY, USA.				

Course topics (Theory)	Week	Learning Outcome
Over view of Electrical/Electronic Systems	1	
Electrical Principles	2	
Electric Circuits and Ohm’ sLaw	3	
Electric Components	4	
Electronic Components and Principles	5	
Tools and Test Equipment	6	
Wiring and Wiring Repairs	7	
Manufacturer Service Information	8	
Basic Electrical Tests	9	
Review of Safety	10	
Automotive Computer Operation	11	
Battery Technology	12	
Starting Systems	13	
Charging Systems	14	
Practical Topics	**Week**	**Learning Outcome**
Defining the working system in laboratory and how to do the report And using the apparatus. Using multi-meter (Amp, volt, ohm, etc.) and Using (DC) power supply, oscilloscope and function generator.	1	
Colors of resistance	2	
Connecting resistances in series	3	
Connecting resistances in parallel.	4	
Combination resistances (Series-Parallel)	5	
Rectification	6	

Capacitor	7	
Transistor	8	
Relay	9	
Soldering	10	
Starting system	11	
Charging system	12	

Questions Example Design

1. Compositional:

Q:If the voltage in a circuits 12 volts and the resistance is equal to 3ohms. How much current is follow in this circuit?

Answer: E=I*R

I=12/3=4Amp

2.True or false type of exams:

1:The current values in all paths in a parallel circuit are same.

Ans: False. The current values in all paths in a parallel circuit are different.

2-Ignition coils change high voltage into low voltage.

Ans: False.

3. Multiple choices:

1-When the car is starter an king at idle rpm, the battery voltage should equal to

(A) 12.5volts

(B) (B)14voltsAnswer(B)

2-Electronic devices usually operate using which of the following voltages?

A. 42 volts

B. 12 volts

C. 6 volts or less

D. 2 volts or less

Answer(C)

4. Completion

1-The sensors are _____ devices to the computer.

Answer: input

2- The starter turns the engine flywheel through a set of _____.

Answer: gears

5. Matching

Match the vehicle part or system with its description.

A. Sensor

B. Actuator

C. Electric device

D. Fuel injection

E. Computer

F. Electronic device

G. Alternator

H. On-board diagnostics

I. Wiring harness

1. D Replaced carburetors
2. G Recharges the vehicle battery
3. F Semiconductor
4. H Quick way to check system condition
5. I Connects electrical devices
6. A Sends a signal to the computer
7. C Uses electricity to do work

6. **List and describe four components of a computer network.**

- **Sensors**
- **Computer**
- **Actuators**
- **Wiring harness**

7.What are the advantages of Electrical/Electronic Devices?

Answer:

- Better efficiency
- Faster
- More accurate
- Higher fuel economy and performance
- Fewer toxic emissions

Extra notes:

Weneedsomeequipmentanddeviceswhichisrequiredinourlaboratoryinordertoexecutethejob sheets of this subject.

External Evaluator:

This Module (Course Syllabus) is reviewed by (**Abubakir Aziz Ahmed**). The Module (Course Syllabus) Catalogue assessed and approved all content of the Basic Transportation Electricity subject as she admitted well organized and is almost covered the several terms of Basic Transportation Electricity-Module (Course Syllabus) Catalogue1.

Abubakir Aziz Ahmed
M.s.c Electrical engineering