

Engineering Program

Specialization	Hybrid Vehicles Technology
Course Number	20220271
Course Title	Hybrid Vehicles Diagnosis, Repair and maintenance
Credit Hours	3
Theoretical Hours	3
Practical Hours	0

وصف المادة الدراسية:

Hybrid System over view. Principles of Diagnosis and Maintenance and Repair of Hybrid Vehicles, Engine Control System, Fuel and EVAP system, High-Voltage Battery. Engine, Hybrid Vehicle control system ,Electric Power steering, , other systems .

أهداف المادة الدراسية:

Course Objectives:

This course provides students the fundamentals of working in the automotive workshop, and how to work safely in a shop environment. Students learn to identify the major components and systems of an automobile; how to navigate both printed and electronic service information systems; and how to follow service procedures. The course focuses on the proper use of shop equipment such as hand tools, power tools, and specialty tools, including proper usage, storage and safety guidelines; fasteners, fluids, and vehicle maintenance; and measuring devices such as micrometers and dial indicators.

الوصف العام:

رقم الوحدة	اسم الوحدة	محتويات الوحدة	الزمن
1.	Introduction to Automotive service Technology	<ul style="list-style-type: none"> • Hybrid Systems • Hybrid system components. • MG1, MG2, Planetary Gear Unit, Inverter. • Hybrid System Control Modes. 	1 weeks
2.	Hybrid Service Safety	<ul style="list-style-type: none"> • Overview • Insulating Gloves • Removing Jewelry • Wearing Eyes protection Rubber Shoes. • Fire Extinguishers • Towing Safety • Insulating Connectors • Testing High Voltage • Using Insulation Tools 	1 week
2.	Hybrid Transaxle Service	<ul style="list-style-type: none"> • Hybrid Transaxle. • Transaxle Damper. • Reduction Unit. • Permanent Magnet Motor. • Speed Sensor (Resolver). • Hybrid Transaxle Fluid service 	2 weeks
3.	Inverter Assembly Service	<ul style="list-style-type: none"> • Inverter. • Boost Converter. • Inverter Assembly Diagram. • Converter. • A/C Inverter. • Cooling System for Inverter, MG1 and MG2. 	2 week

		<ul style="list-style-type: none"> • HV ECU. 	
4.	HV Battery Service	<ul style="list-style-type: none"> • Power Cables. • Battery ECU. • State Of Charge (SOC). • System Main Relays (SMR) • Service Plug. • HV Battery Cooling System. • Auxiliary Battery. • Remove HV Battery and its Pack. • Battery Sensors • HV Battery Cooling Systems • Check HV Battery Relays and Connectors 	2 week
5.	Engine Service	<ul style="list-style-type: none"> • Intake manifold. • Engine Control System Sensors. • Exhaust System. • Cooling System. • Bladder Fuel Tank • MG1 • MG2 • Planetary Gear Unit • Lubricating System • Air filter • Oil service • Ignition System 	2weeks
6.	Chassis Service	<ul style="list-style-type: none"> • Shift Control. • Shift Actuator. • Cycloid Reduction Mechanism. 	3 weeks

		<ul style="list-style-type: none"> • Brake System. • Hydraulic brake booster. • Brake Actuator. • Skid Control ECU. • Brake Pedal Stroke Sensor. • Regenerative Brake Cooperative Control. • Electronic Brake Distribution. • Brake Assist Control. • Electric Power Steering, Torque Sensor. 	
7.	Fuel and Evaporative Systems Service	<ul style="list-style-type: none"> • Input Sensors (Air Flow Sensor, Air Temperature Sensor, Mass Airflow Sensor, Manifold Absolute Pressure Sensor, Oxygen Sensor, other EFI Sensors). • Electrical Instrumentation. • Evaporative System. • Exhaust and Emission Systems 	2 week
8.	Diagnosis Procedures	<ul style="list-style-type: none"> • Using Scan Tools • Health Check • Check All Hybrid Systems with the Scan Tool. 	1 weeks

طرق التقييم المستخدمة:

التاريخ	نسبة الامتحان من العلامة الكلية	الامتحانات
/ / التاريخ:	40%	الامتحان المتوسط
/ / التاريخ:	10%	أعمال الفصل
/ / التاريخ:	50%	الامتحانات النهائية

طرق التدريس:

❖ Lecture

الكتب و المراجع:
الكتاب المقرر:

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المراجع:

1. Jack Erjavec “ Automotive Technology. A system Approach”, 4th edition, Thomson Delmar Learning, a division of Thomson Learning Inc. 2005