



Engineering Program

Specialization	Common
Course Number	20207141
Course Title	Automotive Engineering
Credit Hours	3
Theoretical Hours	3
Practical Hours	0



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



Brief Course Description:

- ❖ Introduction of fundamentals of engine construction and operation, engine systems, automotive transmission (manual and automatic), suspension system, wheel alignment, automotive brake system, steering system, automotive electric and electronic systems.

Course Objectives:

1. A system approach of understanding all automotive systems and their various subsystems
2. Understanding the important of safety and accident prevention in an automotive workshop.
3. Outline the basic of both gasoline and diesel engines.
4. Outline the basics of al automotive systems and subsystems.



Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	Introduction Car Construction	<ul style="list-style-type: none"> ▪ Historical background, car components and their functions ▪ Automotive engines 	
2.	Introduction To Engines	<ul style="list-style-type: none"> ▪ Engine types ▪ Engine systems ▪ Differences between automotive engines and other types of engines ▪ Engine classification according to: <ul style="list-style-type: none"> 0 number and arrangement of cylinders Value arrangement in cylinder head 	
3.	Engine construction	<ul style="list-style-type: none"> ▪ Types of cylinders blocks cylinders ▪ Types of pistons ▪ Types of cylinder head ▪ Types of combustion chambers ▪ Connecting rod ▪ Engine gaskets ▪ Crankshaft ▪ Parts attached to cylinder block ▪ Oil pan 	
4.	Engine systems	<ul style="list-style-type: none"> ▪ Cooling system ▪ Lubricating system ▪ Fuel-feeding system ▪ Ignition system 	
5.	Transmission	<ul style="list-style-type: none"> ▪ Friction clutch ▪ Manual gear box ▪ Synchronize gear box ▪ Inter lock devices ▪ Automatic gear box ▪ Planetary gearing system ▪ Hydraulic torque convertor ▪ Automatic (hydraulic) gear shifting system ▪ Relationship between gear ratio, torque and rpm ▪ Final drive and drive shaft 	

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

6.	Suspension system	<ul style="list-style-type: none"> ▪ Purpose of suspension system ▪ Components of suspension system ▪ Types of springs used in suspension ▪ Shock absorbers types , purpose and operation ▪ Automatic level control ▪ Rear suspension ▪ Front suspension me pherson type ▪ Front suspension ▪ Electronic suspension and ride control ▪ Air suspension 	
7.	Steering system	<ul style="list-style-type: none"> ▪ Purpose of steering system ▪ Steering system components ▪ Types of steering gears (recirculating-ball steering gear, rack and pinion) ▪ Steering ratio ▪ Power steering systems, components of power steering, power steering types ▪ Steering electric power ▪ Four –wheel steering 	
8.	Wheel alignment	<ul style="list-style-type: none"> ▪ Toe- in, Toe- Out ▪ Camber angle ▪ Wheel axis inclination ▪ Caster angle 	
9.	Braking system	<ul style="list-style-type: none"> ▪ Working principle of automotive (hydraulic) brake system ▪ Types of wheel brake mechanism ▪ Brake system components ▪ Servo brake ▪ Brake master cylinder (construction) ▪ Anti lock brake system(abs),types components and working principle ▪ Traction control system, purpose components and operation 	

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



Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/------
	Second Exam	20%	
Homeworks and quizzes		10%	
	Final Exam	50%	

Teaching Methodology:

1. Lectures and presentations

Text Books & References:

Textbook:

1. Jack ERJAVEC, AUTOMOTIVE Technology A system Approach, Delmar. U.S.A – 2005.
2. William H. Crouce and Donald Anglin, Automotive Mechanics, Hill school publishing company, USA, 1993.



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



Engineering Program

Specialization	Common
Course Number	20207182
Course Title	Automotive Engineering Workshops
Credit Hours	1
Theoretical Hours	0
Practical Hours	3



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



Brief Course Description:

- ❖ Personal safety, automotive workshop safety area Universal hand tools and equipments, special tools used in automotive workshop, car's units disassembly / assembly and adjustments.

Course Objectives:

1. Obtain applied skills in disassembly / assembly of all automotive systems and subsystems.
2. Obtain practical skills for using the tools and devices automotive diagnosis, maintenance and repair.
3. Obtain practical skills for implementing the maintenance and repair procedures.



Detailed Course Description:

Lab Number	Lab Name	Lab Content	Time Needed
1.	Safety in automotive workshop tools and equipments	<ul style="list-style-type: none"> ▪ Personal safety ▪ Tool and equipment safety ▪ Universal hand tools ▪ Special tools for automotive mechanics 	
2.	Engine disassembly , assembly and inspection	<ul style="list-style-type: none"> ▪ Disassembly /assembly of cooling system ▪ Disassembly/assembly of lubricating system ▪ Disassembly/assembly of adjustment of gasoline engine fuel system ▪ Disassembly / assembly and adjustment of diesel engine fuel system 	
3.	Engine reconditioning	<ul style="list-style-type: none"> ▪ Disassembly \ assembly of cramesheft ▪ Piston group disassembly \ assembly ▪ Camshaft and related parts disassembly /assembly ▪ Crankshaft and camshaft timing ▪ Value clearance adjustments ▪ Cylinder head assembly cylinder head gaskets 	
4.	Transmission	<ul style="list-style-type: none"> ▪ Clutch disassembly \assembly and adjustments ▪ Gear box disassembly \assembly ▪ Drive shaft disassembly \assembly ▪ Final drive disassembly \assembly 	
5.	Suspension system and steering system	<ul style="list-style-type: none"> ▪ Suspension system components assembly / disassembly ▪ Steering system components assembly /disassembly 	
6.	Brake system	<ul style="list-style-type: none"> ▪ Brake system components disassembly \ assembly ▪ Tires disassembly \ assembly 	

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Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	
	Reports	30%	
	Final Exam	50%	

Teaching Methodology:

- ❖ Laboratory

Text Books & References:

Textbook:

1. Jack ERJAVEC, AUTOMOTIVE Technology A system Approach, Delmar. U.S.A – 2005.
2. William H. Crouce and Donald Anglin, Automotive Mechanics, Hill school publishing company, USA, 1993.



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