Department	General Studies	Major							
Course Name	Physics	Course Code	PHYS 101						
Prerequisites	---	Credit Hours CRH	3		CTH	4			
			L	2	P	2	T	0	

Course Description :

This course is designed even correspond with the training requirements of the specialized departments in colleges.

The course contains the basic concepts in the measure science and provides a simple concept about the scalar and vector quantities. Also, it contains the scientific and applied concept of the motion in one dimension (on a straight line), force, work and energy. Also, the course is designed to give the students a basic knowledge in the thermal physics, electrostatics and electric current. Moreover, the student can able understanding theoretical concepts by using the simple laws.

General Objective:

The course enables students to gain the theoretical and practical background in physics.

Detailed Objectives:

Trainee will be able to:

1-	**know units of physical quantities in SI**
2-	**recognize between the scalar and vector quantities**
3-	**apply laws of Newton mechanics in the motion on a straight line**
4-	**apply work and energy laws**
5-	**apply the basic concepts and laws of the thermal characteristics in the calculation of temperature and heat quantity for material**
6-	**apply the basic concepts for the electrostatic and electric current**
7-	**implement the practical experiments**
8-	**use the previous concepts in the field of his major**

Safety Procedures:

1-	Must provide extinguisher and fire detection device
2-	Follow all instruction given by the trainer
3-	Always use the appropriate safety tools in the laboratory (safety goggles, lab coat and gloves)
4-	Don't eat food or drink in the laboratory and leave the work area clean
5-	Wash the hands well after leaving the laboratory

Detailed of Theoretical and Practical Contents		
Hours	**Contents**	**Assessment Tools**
14	**1st Unit: Measurements, Scalar and Vector Quantities** • Introduction • Chapter One: Measurements • (1-1) Physical Quantities • (1-1-1) Base Quantities • (1-1-2) Derived Quantities • (1-2) Systems of Measurement • (1-3) Prefixes of SI Units • (1-4) Conversion between Units • Chapter Two: Scalar and Vector Quantities • (2-1) Scalar Quantities • (2-2) Vector Quantities • (2-3) Vectors Addition • (2-3-1) Graphical Method • (2-3-2) Cosine Law Method • (2-4) Properties of Vector Addition • (2-5) Vectors Analysis • (2-6) Vectors Product • (2-6-1) Scalar Product (Dot Product) • (2-6-2) Vector Product (Cross Product) • (3) Examples and Problems	Practical skills Perform home work False and true questions Fill in the blanks questions Multi choice question Matching question Oral presentation and discussion Short oral question Literature question
14	**2nd Unit: Motion, Force, Work and Energy:** • (1) Introduction • (2) Rectilinear Motion • (2-1) Distance and Displacement • (2-2) Average Velocity • (2-3) Instantaneous Velocity • (2-4) Average Acceleration • (2-5) Instantaneous Acceleration • (3) The Laws of Motion • (4) Newton's Laws of Motion • (4-1) Newton's First Law • (4-2) Newton's Second Law • (4-3) Newton's Third Law • (5) Friction • (6) Work • (6-1) Concept of Work • (6-2) Work done by a Constant Force • (7) Energy • (7-1) Kinetic Energy • (7-2) Potential Energy • (7-3) Conservation of Energy • (8) Examples and Problems	Practical skills Perform home work False and true questions Fill in the blanks questions Multi choice question Matching question Oral presentation and discussion Short oral question Literature question

Detailed of Theoretical and Practical Contents		
Hours	**Contents**	**Assessment Tools**
12	**3rd Unit: Thermal Physics** • (1) Introduction • (2) Temperature • (3) Temperatures Scales • (3-1) Celsius Scale (°C) • (3-2) Kelvin Scale (K) • (3-3) Fahrenheit Scale (°F) • (3-4) Equations of Convert Temperatures • (4) Quantity of Heat • (5) Difference between Temperature and Quantity of Heat • (6) Specific Heat • (7) Latent Heat • (8) The Concept of Thermal Equilibrium • (9) Methods of the Heat Transfer • (10) Examples and Problems	Practical skills Perform home work False and true questions Fill in the blanks questions Multi choice question Matching question Oral presentation and discussion Short oral question Literature question
12	**4th Unit: Electrostatics** • (1) Introduction • (2) The Electric Charge • (3) Coulomb's Law • (4) The Electric Field • (4-1) The Electric Field of a Point Charge • (4-2) The Electric Field Lines • (5) Potential Difference and the Electric Potential • (6) The Electric Capacitor (Condenser) • (6-1) Capacitance of the Capacitor • (6-2) Parallel – Plate Capacitor • (6-3) Connecting of Capacitors • (6-3-1) Capacitors in Series • (6-3-2) Capacitors in Parallel • (6-4) The Stored Energy in a Capacitor • (7) Examples and Problems	Practical skills Perform home work False and true questions Fill in the blanks questions Multi choice question Matching question Oral presentation and discussion Short oral question Literature question
12	**5th Unit: The Electric Current and Resistance** • (1) Introduction • (2) The Electric Current • (3) The Current Density • (4) Drift Velocity • (5) Types of The Electric Current: • (5-1) The Direct Current (DC) • (5-2) The Alternating Current (AC) • (6) Ohm's Law and Resistance • (6-1) Ohm's Law • (6-2) Resistance	Practical skills Perform home work False and true questions Fill in the blanks questions Multi choice question

Detailed of Theoretical and Practical Contents		
Hours	**Contents**	**Assessment Tools**
	• (6-2-1) Resistance and Temperature • (6-2-2) Conductivity • (6-2-3) Resistivity • (6-3) Connecting of Resistors • (6-3-1) Resistors in Series • (6-3-2) Resistors in Parallel • (7) The Electric Energy and Power • (8) Ammeters and Voltammeters • (9) Examples and Problems	Matching question Oral presentation and discussion Short oral question Literature question

Textbooks	١- الفيزياء الأساسية تأليف مروان بن أحمد الفهاد ، الناشر: العبيكان (الطبعة الثالثة ١٤٣٣هـ)، ISBN 978-603-503-187-7	•
	٢- الفيزياء العامة تأليف محمد عطية سويلم وآخرون، الناشر: دار الفكر للنشر والتوزيع (الطبعة العاشرة ١٤٣٧هـ-٢٠١٦م)، ISBN 978-9957-07-390-7	•
	٣- أساسيات الفيزياء تأليف ف. بوش ترجمة سعيد الجزيري ومحمد أمين سليمان مراجعة محمد عبد المقصود النادي، الناشر: الدار الدولية للاستثمارات الثقافية (الطبعة التاسعة ٢٠٠٥م) ISBN 977-5107-82-2	•
	٤- الكهربائية والمغناطيسية تأليف غازي ياسين القيسي، الناشر: دار المسيرة للنشر والتوزيع والطباعة (الطبعة الرابعة ٢٠١١م)	•
	• 5- Fundamentals of Physics Extended (10th Edition) David Halliday, Robert Resnick and Jearl Walker	

List of Detailed Equipment for Laboratory, Workshop or Lab

Hours	No.	Laboratory name	Capacity of training	Human Resources with Certificate
32	1-	Physics	**20**	

	Lab of Physical Measurements		
Hours	**No.**	**Product's Name**	**Quantity**
4	1-	calculater	20
	2-	a vernier caliper	20
	3-	Micrometers	20
	4-	Multimeter	20

Lab of Force Table			
Hours	**No.**	**Product's Name**	**Quantity**
6	1-	Force Table	20
	2-	Ring and string	80
	3-	4 Pulleys	80
	4-	4 Weight Hangers	20
	5-	Masses Protractor	120
	6-	30-cm Ruler	20
	7-	Protractor	20

Lab of Simple Pendulum			
Hours	**No.**	**Product's Name**	**Quantity**
4	1-	a support stand with a string clamp,	20
	2-	a small spherical ball with a 125 cm length of light string,	20
	3-	a meter stick	20
	4-	a vernier caliper	20
	5-	timer	20

Lab of Fletcher's Trolley			
Hours	**No.**	**Product's Name**	**Quantity**
4	1-	1.2 m aluminum starter track	20
	2-	car	20
	3-	pulley with clamp	20
	4-	adjustable end stops	20
	5-	5 ,10, 20,50 gram mass	60
	6-	string	20

Lab of Latent and Specific Heat			
Hours	**No.**	**Product's Name**	**Quantity**
4	1-	Calorimeter with stirrer weighing scale	20
	2-	Isolated calorimeter	20
	3-	Cup of glass	20
	4-	Thermometer	20
	5-	Forceps	20
	6-	two metal solids (made of different materials)	60
	7-	Paper towels	5
	8-	Small pieces of ice (Templates)	10
	9-	Ice maker	1
	10-	boiler (beaker and hotplate)	1
	11-	Balance 1kg	2

Lab of Charging of Capacitor and its Discharging			
Hours	**No.**	**Product's Name**	**Quantity**
6	1-	DC Power Supply 30 V, 2 A (230 V, 50/60 Hz)	20
	2-	Components in plug-in housings with two plugs separated by 19 mm Capacitor: 1000µF	20
	3-	Components in plug-in housings with two plugs separated by 19 mm Resistance: 150KΩ Tolerance: 5 % Max. power: 2 W	20
	4-	ammeter	20
	5-	voltmeter	20
	6-	Patch cord with multilam plug / jack , Length: 75 cm, Wire cross-section: 1 mm2, Continuous current: max. 19 A, Plug and jack: 4 mm	120
	7-	Electric load (A variable resistance)	20

Lab of Ohm's Law			
	No.	**Product's Name**	**Quantity**
	1-	DC Power Supply 30 V, 2 A (230 V, 50/60 Hz)	20
	2-	Components in plug-in housings with two plugs separated by 19 mm Resistance: 470 Ω Tolerance: 5 % Max. power: 2 W	20
	3-	Components in plug-in housings with two plugs separated by 19 mm Resistance: 100 Ω Tolerance: 5 % Max. power: 2 W	20
	4-	ammeter	20
	5-	voltmeter	20
	6-	Patch cord with multilam plug / jack , Length: 75 cm, Wire cross-section: 1 mm2, Continuous current: max. 19 A,Plug and jack: 4 mm	120
	7-	Electric load (A variable resistance)	20