

The Public Autho	rity for Ap	plied Education	and Training
The Higher Institute of Ene	rgy	HIE- T	D - QP03 – F621
Department		Elec	ctrical Power
Major: Electrical Equipment &Machines Maintenance	Awarded Training	l Certificate: Diploma	Program Duration: Two years (4 Semesters)



## FIRST TRAINING SEMESTER

Course Code Lecture Hours		Electrical Officials (1)			
	4	EG 101 Practical Hours	0	Credits Total Hours	4
Course Description			,		
This course gives the	e traii	ner the basic principles	of Dire	ect Current Circuit	s. He
connection of resista	ance.	series, parallel, series u	nparal	leled and the star	-delta
connection. He studie	es the	concepts of power energy	iy.		
0 <b>T</b>					
Course Litle		General Workshop		Credits	3
Lecture Hours	0	Practical Hours	6	Total Hours	6
Course Description					
Basic Skills - Knowin	g Han	d Tools - The use of meas band saw Electrical extern	suring	and planning tools	s - the
use of the file - the us		Thand Saw Electrical exte	1131011	a -	
Course Title		Electrical Materials		-	
Course Code	10	EG 106		Credits	2
Course Description	2	Practical Hours	U	Total Hours	2
It explains the natur	e of	materials and their class	sificat	ions in terms of	being
conductive and insu	lating	materials for electricity	and s	semiconductors. It	also
deals with the uses of	of diffe	erent materials and exam	ples c	of them, their prop	erties
and uses in the field	UT EIE	ctricity.			
Course Title		Engineering Drawin	a		
Course Code		EG 102	3	Credits	2
Lecture Hours	0	Practical Hours	4	Total Hours	4
<b>Course Descriptio</b>	n				
This course presents	the b	asic drawing skills of eng	ineeri	ng shapes and me	hods
using basic tools su underlines the isome	ich as tric nl	anes by applying exercises	actor, es.	and compass. Al	so, it
	and pr	ance by applying exclus			
Course Title		Computer (1)		-	
Course Code		CS 101		Credits	1
Course Description	0	Practical Hours	2	Total Hours	2
In this course the stu	dents	will learn about compute	er hist	orv and its compo	nents
as a fundamental int	roduc	tion. which is the theore	tical p	art of the course.	Then
they will learn how to	o use	Microsoft Windows and	Micro	soft Word, which i	s the
munation mant of the a	oureo				• • • • •
practical part of the c	ouise				0
practical part of the c	ouise	h <u>.</u>			
Course Title	.oui 36	Mathematics (1)			
Course Title Course Code	J	Mathematics (1) MA104		Credits	4
Course Title Course Code Lecture Hours	4	Mathematics (1) MA104 Practical Hours	0	Credits Total Hours	4
Course Title Course Code Lecture Hours Course Descriptio	4 n	Mathematics (1) MA104 Practical Hours	0	Credits Total Hours	4
Course Title Course Code Lecture Hours Course Descriptio This course intr	4 n oduc	Mathematics (1) MA104 Practical Hours es arithmetic skills	0 , inc	Credits Total Hours luding polynor	4 4 nials
Course Title Course Code Lecture Hours Course Descriptio This course intr factoring, polynon	4 n oduc nials	Mathematics (1) MA104 Practical Hours es arithmetic skills operations, coordinat	0 , inc e sys	Credits Total Hours luding polynor tem, and statist	4 4 nials ics.
Course Title Course Code Lecture Hours Course Descriptio This course intr factoring, polynon Course Title	4 n oduc nials	Mathematics (1) MA104 Practical Hours es arithmetic skills operations, coordinat English Language (1)	0, inc	Credits Total Hours luding polynor tem, and statist	4 4 nials ics.
Course Title Course Code Lecture Hours Course Descriptio This course intr factoring, polynom Course Title Course Code	4 n oduc nials	Mathematics (1) MA104 Practical Hours es arithmetic skills operations, coordinat English Language (1) EN 126	0 , inc e sys	Credits Total Hours luding polynor tem, and statist	4 4 nials ics.
Course Title Course Code Lecture Hours Course Descriptio This course intr factoring, polynom Course Title Course Code Lecture Hours	4 n oduc nials	Mathematics (1) MA104 Practical Hours es arithmetic skills operations, coordinat English Language (1) EN 126 Practical Hours 2	0, inc ce sys	Credits Total Hours luding polynor tem, and statist edits 3 al Hours 4	4 4 nials ics.
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Course Title Course Code Lecture Hours Course Descriptio This course intr factoring, polynom Course Title Course Code Lecture Hours Course Description This course introduct functions and listenii of teaching such cou	4 n oduc nials 2 es a do ng/spe	Mathematics (1) MA104 Practical Hours es arithmetic skills operations, coordinat English Language (1) EN 126 Practical Hours 2 prain of vocabulary items paking /writing as well as enabling the trainees to e	0, inc e sys Cre Tot s, stru evalu expres	Credits Total Hours luding polynor item, and statist addits 3 al Hours 4 ctural themes, lang ation. The ultimate s themselves in Er	4 4 ics.
Course Title Course Code Lecture Hours Course Descriptio This course intr factoring, polynom Course Title Course Code Lecture Hours Course Introduct functions and listenin of teaching such cou in a simple way and hobbies and homedar	4 n oduc nials 2 es a do ng/spo rse is d to c	Mathematics (1) MA104 Practical Hours es arithmetic skills operations, coordinat English Language (1) EN 126 Practical Hours 2 main of vocabulary items eaking /writing as well as enabling the trainees to e reate short sentences a sound comprehended a	0, inc e sys Cre Tot s, stru evalu expres about	Credits Total Hours luding polynor item, and statist al Hours 4 ctural themes, lang ation. The ultimate s themselves in Er their relatives, fri Je.	4 4 ics.
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Course Title Course Code Lecture Hours Course Descriptio This course intr factoring, polynom Course Title Course Code Lecture Hours Course Intr Course Title Course Code Lecture Hours Course introduct functions and listenit of teaching such cou in a simple way and hobbies and homelar Course Code Lecture Hours Course Code Lecture Hours Course Description This course gives th studies the definition connection of resiste and open circuits, als Course Title Course Code Lecture Hours Course Code Lecture Hours Course Title Course Code Lecture Hours Course Course Code Lecture Hours Course Cours	4     4     1     oduc     inials     2     2     cos a dd     rse is     d to c     din a     fysig     co und     fysig     EG 1     0     n     con th     the el the     is is d	Mathematics (1) MA104 Practical Hours es arithmetic skills operations, coordinat English Language (1) EN 126 Practical Hours 2 Omain of vocabulary items eaking /writing as well as enabling the trainees to e reate short sentences a sound comprehended la Electrical Circuits Lab EG 111 Practical Hours estries, parallel and how t lerstanding and solving a cs Lab 12 Practical Hours e electromagnetism phen by current passing throug ectromagnetic force to m	0 Cree sys Tot Tot s, stru evalu	Credits Total Hours luding polynor item, and statist addits 3 al Hours 4 ctural themes, lang ation. The ultimate s themselves in Er their relatives, fri ge. Credits Total Hours act Current Circuit lab. Then he studie nect it in lab, and eriments above. Credits Total Hours and constant of the studie part of the studie rotal Hours and constant of the studie on by experimenting aductor. apply pra	4 4 4 4 ics. ics. ics. ics. ics. ics. ics. ics.
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## SECOND TRAINING SEMESTER

Course Title	Elect	rical Circuit (2)			
Course Code	EG 15	51		Credits	5
Lecture Hours	4	Practical Hours	2	Total Hours	6
Course Descrip	tion				
Introduction to AC impedance. Imped connection in se impedance. Electr power, and powe circuit.	current ance co ries, pa omagne r factor.	. Resistance, inductive rea nnection in series, paralle rallel, and combined. Sti tic inductance. Active pow . Operations of single-ph	ctanc I, and ar an /er, re ase t	e, capacitive reactar combined. Admitta d delta connection eactive power, appar transformers. Resor	nce, nce of rent nant

Course Title		Electrical Maintenan	ce W	/orkshop (1)	
Course Code		EM 153		Credits	3
Lecture Hours	0	Practical Hours	6	Total Hours	6
Course Description	1				

Electrical measuring devices - springboard - specifications - types - uses - sizes use of springing device to remove the springing from the motor shaft. Convection oven, induction furnace, oil oven specifications and usage. Varnish specifications and use. Copper coil and insulation. Assembly and disassembly of small electric motors. Assembly and disassembly of a small electric generator.

Course Title		Electrical Drawings			
Course Code		EM 154		Credits	2
Lecture Hours	0	Practical Hours	4	Total Hours	4
Course Description	1				
Electrical symbols of line diagram of a gen Single line diagram rectification circuits. synchronous generate line. Single line diagra	powe nerate of a Singl or. Sin m of	er plants, Single line draw or. Single line diagram o n excitation transformer le line diagram of a tap- ngle line diagram of an 11 11KV, 6,6KV, and 3,3KV m	/ing of f a g . Sin chan IKV a notor	of a power plant. Sin Jenerator's transform Igle line diagram o ger. Cross-section i and 132KV transmiss	igle ner. fa na ion
Course Title		Electrical Measuring	Inst	truments	
Course Code		EM 155		Credits	3
Looturo Houro	2	Brootical Hours	2	Total Hours	4

		Electrical measuring	11130	amento	
Course Code		EM 155		Credits	3
Lecture Hours	2	Practical Hours	2	Total Hours	4
<b>Course Description</b>	1				

This course covers the theory of different measuring instruments for voltage, current, resistance, power factor, and kWh. Students learn the function of the clamp ammeter, megger, phase rotation, and cable route locator.

Course Title		Electrical Powerplan	Its		
Course Code		EM 157		Credits	2
Lecture Hours	0	Practical Hours	2	Total Hours	2
Course Description	n				
Introduction on electri model, Thermal Statio the station sections, s Feeding water syste (visit),Power Simulato Doha west power sta station, chlorine static boards(switching roo station study.	cal p ns (s eawa em (v r visi tion, on stu m), c	ower station ,Internal visit team) , Doha west power : ter station (visit), Cooling visit), Simple circuit foi t, Doha west power statior steam turbine auxiliaries dy, ECR electrical control ircuit breakers and transf	for E static syst syst Bo visit ' stud roon forme	Doha west power stat on visit and over view eem of seawater stati iller structure , Bo , steam turbine study dy of Doha west poor n study, Electrical min rrs in Doha west poor	tion v of ion, iler y of wer mic wer

Course Title		Computer (2)			
Course Code		CS 151		Credits	1
Lecture Hours	0	Practical Hours	2	Total Hours	2

Course Description In this course the students will learn about computer and its components and the use of MS-Excel and windows to manage file then introduction to MS-Word.

Course Title		English Language (	2)		
Course Code		EN 166		Credits	2
Lecture Hours	1	Practical Hours	2	Total Hours	3
Course Description	n				

This course introduces different vocabulary items, structures, language functions and listening/ speaking /writing as well as evaluation. It aims at familiarizing the trainees with the forms of (be) (do)&(Have) as auxiliary verbs as well as full verbs. Trainees also learn to make questions, replying with questions, the use of passive forms in the present and in the past. In addition to future tense which is used in expressing decisions and intentions in the future using (will) and (going to).



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The Higher Institute of Ener	rgy	HIE- T	D - QP03 – F621
Department		Elec	ctrical Power
<b>Major</b> : Electrical Equipment &Machines Maintenance	Awarded Training	l Certificate: Diploma	Program Duration Two years (4 Semesters)



Course Title		Mathematics (2)			
Course Code		MA154		Credits	3
Lecture Hours	3	Practical Hours	3	Total Hours	3
Course Description	۱				
This source intro	dua	o orithmotio okillo	inal	uding trigonomo	

This course introduces arithmetic skills, including trigonometry, vectors, complex numbers and derivatives and integration.

## THIRD TRAINING SEMESTER

		D.C. Machines (1)			
Course Code		EM 201		Credits	5
Lecture Hours	4	Practical Hours	2	Total Hours	6
<b>Course Description</b>	า				
This course exami operation and app the study of direct with series, parall	nes f licati DC n el ar	the basic theory, cha on of rotating electri- nachine with separate nd combined long, s	racte cal m ed exe short,	ristics, construct nachines. It inclu citation, DC Mac and combined	tion udes hine DC
Machine. Application	ons c	on DC generators and	mot	ors of power pla	nts.
Course Title		Electrical maintena	nce w	orkshop (2)	
Course Code		EM 203		Credits	3
Lecture Hours	0	Practical Hours	6	Total Hours	6
Course Description	ı				
Theoretical study a kilovolt in various voltage network w device to check the - magnetic contacte electric buoys.	ind p form ith m e cutt or / C	ractical application or is and mode of opera- naintenance work on ter and check the qua ompressors, protecto	n the tion them lity o ors, pl	circuit breakers and used in the and the use of f the oil of the ci hotovoltaic cells	(11) low f the utter and
Course Title		A.C. Machines (1)		One dit	
Looture Hours	2	EIVI 200	2	Total Hours	4
Lecture Hours	3	Practical Hours	2	Total Hours	5
The students will be phase and three phase	able es.	to connect and operate	typica	al AC machines; s	ingle
Course Title		Protection (1)			
Course Code		EM 211		Credits	3
Lecture Hours	2	Practical Hours	2	Total Hours	4
Course Description	า				
includes understan components such	iding as f	the principle of operatives, relays, circuit	er sy ation break	stem protection of protection systems, and measu	that stem iring
includes understar components such transformers and t for transmission lin Course Title	nding as fi heir a nes, i	the concepts of pow the principle of opera- uses, relays, circuit i applications and desi- reactors, transformer Power Electronics (	er sy ation break gning s, and 1)	stem protection of protection sys ers, and measu g protection syst d distribution rai	that stem uring ems ils.
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## FOURTH TRAINING SEMESTER

Course Title		Measuring and Control systems				
Course Code		EM 265		Credits	2	
Lecture Hours	1	Practical Hours	2	Total Hours	3	
Course Description						

Pneumatic units. The natural properties of air. The effect of heat and pressure on air. The ability of air to absorb water. Flow velocity. Compressed air as a control medium. Pneumatic control circuits. Basics of hydraulic control. Hydraulic action and control elements. Hydraulic control circuits. Air compress special units, natural specification of the air, temperature and pressure affect in the air, flow speed, compress air as control system, control circuit with compress air, hydraulic control principal, trip hydraulic control elements, hydraulic control system.

Course Title		Electrical Maintenance workshop (3)				
Course Code		EM 253		Credits	3	
Lecture Hours	0	Practical Hours	6	Total Hours	6	
Occurrent Descentionalise						

Study the synchronies generator (type, size, specification, using), generator check. Electrical transformer maintenance (type, size, specification, use), electrical transformer maintenance exercise (assemble and disassemble), terminal test using measuring relay, study diesel generator specification, diesel generator operation, diesel generator maintenance. Electrical voltage regulation, electrical change over switch between main and auxiliary supply of diesel generator, power cable (types, size, use, maintenance

Course Title		AC Machines (2)			
Course Code		EM 255		Credits	5
Lecture Hours	4	Practical Hours	2	Total Hours	6
Course Description					

Collise Description This course covers 3-phase induction machines, 3-phase synchronous motor and 3-phase synchronous generator.

Course Title	Protection (2)				
Course Code		EM 261		Credits	3
Lecture Hours 2		Practical Hours	2	Total Hours	4

Course Description Focus on designing transmission and distribution protection schemes. This will include protection basics, relay design, protection plans for generators, transmission lines, transformers, and distribution rails. In addition, focus on the settings of the feeder and transformer protection schemes, and the selection of metering transformers for current and voltage for these protection schemes.

Course Title		Power Electronics (2)				
Course Code		EM 263		Credits	3	
Lecture Hours	2	Practical Hours	2	Total Hours	4	
Course Description						

This course covers voltage regulators, single phase and three phase inverters, DC-DC choppers and the cycloconverter.

Course Title		DC Machines (2)			
Course Code		EM 251		Credits	3
Lecture Hours	2	Practical Hours	2	Total Hours	4
Course Description	۱				

This course covers the troubleshooting of the various type of DC machine connections.

Course Title		English Language (4)				
Course Code		EN 268		Credits	2	
Lecture Hours	1	Practical Hours	2	Total Hours	3	
Course Description						

This course introduces a domain of Technical vocabulary items, structural themes, language functions and listening/speaking /writing as well as evaluation. The ultimate goal of teaching such course is enabling the trainees to identify the technical terms in English in a simple way and to express themselves in their jobs, in a sound comprehended language

Course Title		Field Training					
Course Code		EM 300		Credits	15		
Lecture Hours	0	Practical Hours	30	Total Hours	30		
Course Description							
Training in power st	Training in power station at Ministry of Electrical and Water						