

Government of the people's Republic of Bangladesh Affiliated

University of International Computer
Administration Foundation Bangladesh



SYLLABUS FOR THE NSS (Basic) TRADE COURSE

ON

General Electrician

Maintenance by

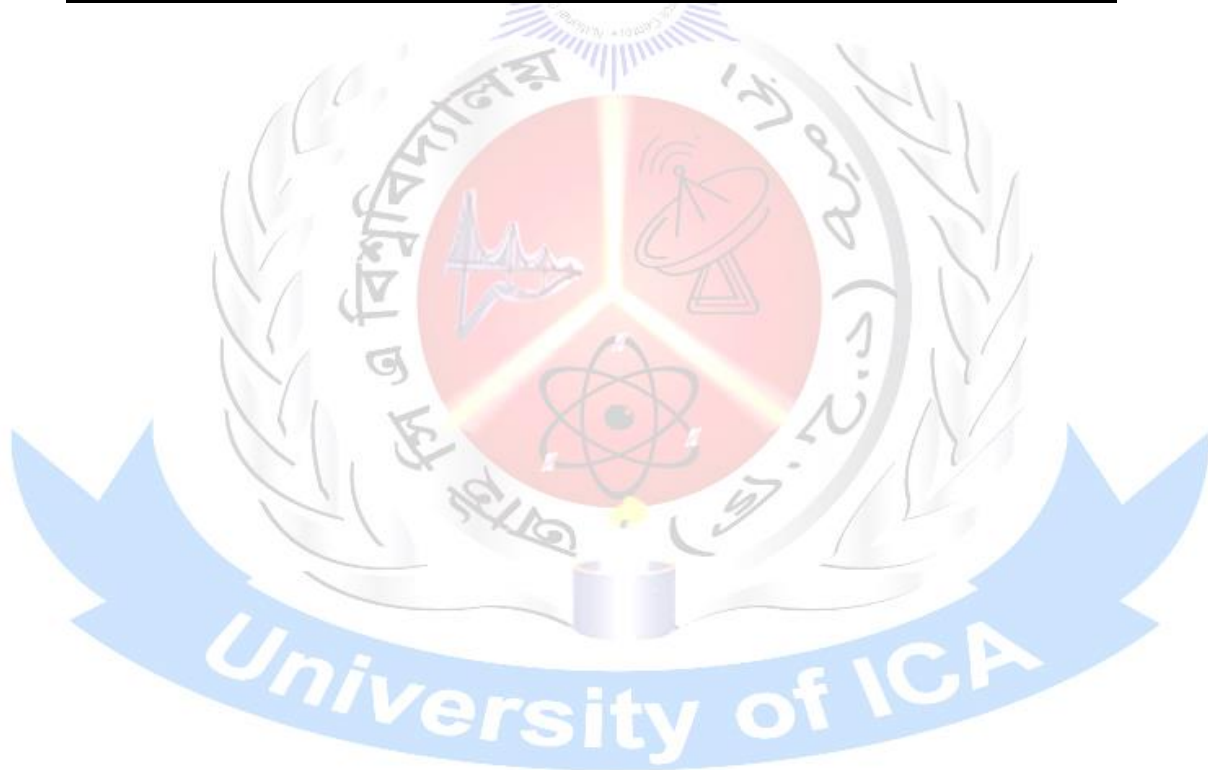
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Total Duration: 360 hours/6 Months

Course Title: General Electrician

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Course Name: General Electrician

Introduction:

Bangladesh is a densely populated country. Over population adversely affects the economic development and progress of a country. It creates problem of foods, Communication, Education, Housing, Health, Sanitation, Employment etc. But if we can provide training to our unskilled people through technical (Trade/Vocational) Course we may convert them into skilled workers and solve the unemployment problem and earn foreign currency also.

Bangladesh Technical board is authorized by parliament of our country to introduce control and develop (Board/Vocational) curriculum.

In this regard BTEB has approved for Conducting General Electrician course by the vocational institute. The Syllabus has been prepared as per present need in the job market.

Objective:

After completion the course the trainee will be able to :

1. Cover procedures, processes, equipment and terminology employed in electrical works along with related fields
2. Practice Electrical equipment and industrial safety rules & regulations.
3. Provide the students with the basic and practical knowledge on electrical equipment.
4. Stress the theory and practical application on all types concerned job.
5. Ensure the theory and practical application on all types of circuit and connection.
6. Practice the theory and practical application on all types of electrical testing.
7. Provide the students with the ability to set up, maintain and operate all types of electrical equipment.
8. Develop idea and analyze drawing & blue print of electrical plan.
9. Emphasis the theory and practical application on all types of motors and generator.
10. Study theory and practical application of transformer.

Course outline

Name of Course	Duration of Course		Entry Qualification
General Electrician	Total 360 hrs	6 day per week, per day 3hrs	Minimum class eight/JSC/JDC or equivalent
	Theory = 60hrs Practical = 240hrs	Theory =1hr, per lesson Practical =2hrs.per practice	
	Basic competency & Communicative English= 60 hrs	Total=3hrs, per working day	

LIST OF COMPETENCIES

Generic/Basic Competencies:

1. Receive and respond, participate and lead to workplace communication
2. Work with others, Team environment and lead small teams
3. Demonstrate work values, practice career professionalism and develop & practice negotiation skills
4. Practice workplace Occupational health and safety procedure
5. Use Basic mathematical concepts
6. Use English in work place

Common competencies:

1. Electrical theories
2. Familiarize with all electrical tools, equipment & machines
3. Understand electrical circuit/drawing
4. Practice on electrical fault finding
5. Adopt safety on working electrical equipment

Core competencies:

1. Perform electrical wiring
2. Practice joint and splice
3. Connect different connection circuit
4. Install Earthing
5. Perform Service connection
6. Check and test electrical wiring
7. Trouble shoot of ceiling fan, table fan & tube-light
8. Dismantling and assembling of DC motor.
9. Over hauling of Dynamo
10. Dismantling and maintenance of AC generator
11. Over hauling of self starter
12. Trouble shooter and maintenance of three phase starter
13. Dismantling and assembling of ac single phase AC-motor
14. Dismantling and assembling of ac three phase motor
15. Study Transformer

Basic Competencies: Contents:

(i) Basic Competencies - 30 hours

SL.NO.	Topics	hours
i). Receive and respond, participate and lead to workplace communication:		
1	a) Explain & follow routinary speaking & messages in a workplace.	1
2	b) Follow routinary speaking & message.	1
3	c) Perform work duties following written notices.	1
ii). Work with others, Team Environment and Lead small Teams:		
4	a) Develop effective workplace relationship.	1.5
5	b) Show good Manner	1
6	c) Respect honorable person (Sir, Trainer, Senior, Trainees)	1
7	d) Describe team role and scope	1.5

8	c) Contribute to work group activities	1.5
9	d) Work as a team member.	1
10	e) Identify own role and responsibility within team	1.5
iii). Demonstrate work values, practice career professionalism and develop & practice negotiation skills		
11	a) Define the purpose of works.	1
12	b) Apply work values/ethics.	1
13	c) Deal with ethical problems.	1
14	d) Integrate personal objectives with organizational goal.	1
15	e) Maintain professional growth and development	2
iv). Practice workplace Occupational health and safety procedure		
16	a) Workplace maintained as per required standards.	1
17	b) Arrange items.	1
18	c) Maintain work areas, Tools and Equipment.	1
19	d) Follow standardizes work process and procedures.	1
20	e) perform work spontaneously.	1
21	f) Occupational safety and health procedure	2
v). Use Mathematical Concepts & Techniques and Use Relevant Technologies:		
22	a) Identify calculation requirements in the workplace.	2
23	b) Appropriate method is selected to carry out the calculation.	2
24	c) Calculations are completed using appropriate method such as addition, subtraction, multiplication and division.	2

a) (ii) Use English in work place - 30 hours

Related Subject-10 hours and General Subject- 20 hours 1 hour/period

On the completion of this course trainees will be able to:

1. Communicate with target persons effectively.
2. Understand the speech of English users.
3. Achieve better professional performance.
4. Speak in English with confidence

Sl. No.	Tropics- Conversational Situation	hours
01	Speaking English – Getting Information & Finding one’s way	1
03	Speaking English – About Tools and Equipments	1
02	Speaking English – About meeting some one & participating in class.	1
04	Speaking English – Daily Activities & Asking About Activities	1
05	Speaking English – Evening Activities and about theoretical contents.	1
06	Speaking English – Meeting at the Train station & Asking Question at the Train station.	1
07	Speaking English – Meeting at the Airport & Getting information at the Airport’s	1
08	Speaking English – About different type of Measuring Tools and Cutting Tools	1
09	Speaking English – Getting to the Hotel & Asking direction.	1
10	Speaking English – Asking about Buses & Traveling by bus.	1
11	Speaking English - About Practical Class.	1
12	Speaking English – Going by Taxi and Asking the time.	1
13	Speaking English – Arriving early or late and Time and the calendar.	1

14	Speaking English – Living in an Apartment.	1
15	Speaking English – Using the Telephone.	1
16	Speaking English – Getting help in stores and talking about shopping.	1
17	Speaking English – Sending and Receiving Letters.	1
18	Speaking English – Talking about the Weather & Trips and sight seeing.	1
19	Speaking English – Talking about Eating & Dinner Conversation.	1
20	Speaking English – About Machines and Materials.	1
21	Speaking English – Common Health problem and Quitting & Finding Jobs.	1
22	Speaking English – Office Details and Office Conversation.	1
23	Speaking English – About Practical Job.	1
24	Speaking English – On a specific situation & Public speaking.	1
25	Speaking English – About Exchanging view with a Persons & Introducing oneself.	1
26	Speaking English – Describing and Narrating events, place, Objects etc.	1
27	Speaking English – About different type of computer, operating system, system and operating software, add remove software, DBM, Email and internet .	4

Practical:

1. Speaking on a specific Situation.
2. Public Speaking.
3. Exchanging views with target persons.
4. Introducing one self.
5. Describing & Narrating events, places, objects etc.
6. Producing the meaning of given words (by the teachers)-Vocabulary.
7. Prepared speech.

Common & Core Competencies: Content

Theory :

Theoretical Part of Technical Topics:

State electron theory
 Define and classify of Electricity
 Define of Current, Voltage, Power, Power factor, Energy and their units
 Define of wire and cable
 Define and classify of joint and splice
 Define and classify of Electrical wiring
 Define of Service connection
 Define of Earthing and classify of Earth electrode
 Define of AC motor classify of AC motor
 Define of DC Generator and Alternator (AC Generator)
 Define and used of Inverter.

Syllabus for the NSS (Basic) Trade Course on General Electrician.

Theory: (Common Competencies and core competencies Period-60)

Sl. No.	Topic	Period
1.	Define PPE or safety and first-aid of electrical shocked treatment.	2
2.	Basic idea of measuring unit	2
3.	Understanding electron theory	1
4.	Description on electricity, Define current, Voltage, Resistance, Frequency and their units	2
5.	Define conductor, insulator and Insulation, Resistance, semiconductor.	2
6.	Define ohm's law.	1
7.	Understanding wire and cable, Advantage & disadvantage of stranded conductor and solid conductor	2
8.	Understanding of different types of cable.	2
9.	Understanding joint, their classification and use of joint.	2
10.	Define Electrical circuit and its classification.	2
11.	Calculate equivalent Resistance of series and parallel circuit.	2
12.	Understanding electrical power, Power factor, Energy and their units.	2
13.	Understanding of fittings and fixtures of electrical installation.	2
14.	Understanding of switch, socket, Fuse, circuit breaker, and their classification.	2
15.	Understanding of wiring classification of wiring and use of wiring.	2
16.	Understanding of earthing. use of earthing, elements of earthing, and earth resistance.	2
17.	Understanding the testing of wiring, causes of test, types of test and procedure of test.	2
18.	Understanding Faraday's electromagnetic, induction law, Lenz's law, Fleming's Left hand and Right hand Rules.	2
19.	Understanding Magnet, Magnetic pole, Magnetic flux, Magnetic field.	2
20.	Understanding Motor, Induction Motor and its classification.	2
21.	Understanding different parts of Induction Motor and their function.	2
22.	Understanding R.P.M and Relation among RPM, pole and frequency.	2
23.	Understanding core and laminated core.	2
24.	Understanding star connection and delta connection.	2
25.	Understanding single phase and poly phase.	2
26.	Understanding starter and different between starter and switch.	2
27.	Understanding magnetic conductor and its function.	2
28.	Understanding Generator and Alternator.	2
29.	Understanding Starting system of Alternator	2
30.	Understanding inverter.	2
31.	Understanding operation procedure of inverter.	2

Practical :(Period-240).

Sl. No.	Topic	Period
1.	Ensure skill in application of safety rules and safety equipment.	4
2.	Ensure skill in electrical shock treatment method and first aid.	4
3.	Identify and use of various types hard tools.	6
4.	Identify and use of various types measuring tools, equipments and instruments.	4
5.	Ensure skill in measurement of wire by wire gauge (Use of PPE in respective job)	4
6.	Ensure skill in measurement of wire by micrometer (Use of PPE in respective job).	4
7.	Ensure skill in making different types cable joint (pig tail joint, tape joint, western-union joint, duplex joint, britannia joint, married joint etc.) (Use of PPE in respective job.)	6
8.	Ensure skill in soldering and tapping of joint. (Use of PPE in respective job)	2
9.	Ensure skill in measuring current, voltage and Resistance by Ammeter, Voltmeter and Ohmmeter (AVO meter) (Use of PPE in respective job)	4
10.	Ensure skill in understanding of drawing and symbols of electrical fittings and fixtures.	4
11.	Install channel (draw layout on the wall, locate points, drill points, set rowel plug then install channel) (Use of PPE in respective job.)	4
12.	Lay cable in channel (Use of PPE in respective job)	2
13.	Install fittings and fixtures. (Use of PPE in respective job)	4
14.	Ensure skill in preparing wiring circuit of 1-lamp controlled by one switch (Use of PPE in respective job.)	4
15.	Ensure skill in preparing wiring circuit of 2 lamps in series controlled by one switch (Use of PPE in respective job)	4
16.	Ensure skill in preparing wiring circuit of 2 lamps in parallel controlled by one switch (Use PPE in respective job)	4
17.	Ensure skill in preparing wiring circuit of 2 lamps in parallel controlled by two switch. (Use PPE in respective job)	4
18.	Ensure skill in preparing wiring circuit of 1 lamp controlled by 2 SPDT switches individually (stair cage ckt.) (Use PPE in respective job.)	4
19.	Ensure skill in preparing wiring circuit of 1 lamp controlled by 3 switches individually (stair cage ckt) (Use PPE in respective job.)	4
20.	Ensure skill in preparing wiring circuit of 4 lamp controlled by 4 switches individually (stair cage ckt) (Use PPE in respective job.)	4
21.	Ensure skill in preparing wiring circuit of a calling bell controlled by 1 switch with 1 indicator. (Use PPE in respective job.)	4
22.	Ensure skill in preparing wiring circuit of a calling bell controlled from 2 places (switch) with 2 indicators. (Use PPE in respective job.)	4
23.	Ensure skill in preparing wiring circuit of a calling bell controlled from 3 places (switch) with 3 indicators. (Use PPE in respective job.)	4
24.	Ensure skill in preparing wiring circuit of a fluorescent tube lamp. (Use PPE in respective job.)	4
25.	Ensure skill in preparing wiring circuit of two fluorescent tube lamps. (Use PPE in respective job.)	4
26.	Ensure skill in preparing a test board. (Use PPE in respective job.)	4
27.	Install (laying) conduit on the roof (draw layout as per drawing on the roof, locate points, install circular box, fan hook etc.) (Use PPE in respective job.)	6
28.	Ensure skill fixing SB, JB, SDB, DB, conduit etc on the wall. (Use PPE in respective job.)	6
29.	Draw fishwire and cable. (Use PPE in respective job.)	4

30.	Ensure skill in preparing house wiring circuit connect meter mainswitch, MCCB, MCB, ELCB, SB, JB, SDB, etc. (Use PPE in respective job.)	6
31.	Ensure skill in continuity test, insulation resistance test, polarity test by AVO meter, megger and test lamp. (Use PPE in respective job.)	6
32.	Ensure skill in measuring earth resistance of an earth lead by earth tester. (Use PPE in respective job.)	4
33.	Ensure skill in installing service main connection. (Use PPE in respective job.)	4
34.	Dismantling and assembling of ceiling fan and identify its starting and running coil by AVO meter or test lamp. (Use PPE in respective job.)	6
35.	Ensure skill in rewinding of a ceiling fan single layer and double layer. (Use PPE in respective job.)	12
36.	Ensure skill in rewinding of a three phase, 4 plate, 24 slot induction motor (Single and double layer) (Use PPE in respective job.)	12
37.	Ensure skill in rewinding a 3 phase, 4 plate, 36 slot induction motor (Single and double layer)	12
38.	Ensure skill in rewinding of a single phase, 4 plates, 24 slot inductions motor. (Use PPE in respective job.)	12
39.	Ensure skill in preparing DOL states circuit by magnetic contactor and start 3phase induction motor by the starter. (Use PPE in respective job.)	6
40.	Ensure skill in preparing forward-reverse starter circuit by magnetic contactor and start a 3phase inductor motor by the starter. (Use PPE in respective job.)	6
41.	Ensure skill in starting a three phase inductor motor by manually controlled star-delta starter. (Use PPE in respective job.)	4
42.	Ensure skill in preparing manually controlled star delta starter circuit by magnetic contactor and start a-3phase induction motor by the starter. (Use PPE in respective job.)	6
43.	Ensure skill in preparing automatic controlled star-delta starter circuit by magnetic contactor and start a-3phase induction motor by the starter. (Use PPE in respective job.)	8
44.	Ensure skill in starting a-3phase induction motor by inverter or frequency drive modiu. (Use PPE in respective job.)	8
45.	Identify different parts of an alternator.	4
46.	Ensure skill in starting of an Alternator.	4

List of Tools, Equipment & machines:

List of tools and equipment:

SL No.	Tools & Equipment Name and Description	Quantity
1.	Neon tester	20 Nos
2.	Electrician knife	20 Nos
3.	Screw driver (Star & flat)	20 Nos
4.	Connecting screw driver	20 Nos
5.	Soldering Iron	20 Nos
6.	Hack saw	20 Nos
7.	Table vice	20 Nos
8.	Angle grinder	20 Nos
9.	Electric drill Machine	20 Nos
10.	Hammer (ball pin & claw)	20 Nos
11.	Mallet	20 Nos
12.	Bearing puller	20 Nos
13.	Pulley puller	20 Nos
14.	Change over switch	10 Nos
15.	Cam starter	10 Nos
16.	Megger500v /1000V Insulation Tester	03 Nos
17.	Earth tester	02 Nos
18.	Multi-meter (Analog)	03 Nos
19.	Multi-meter (Digital)	03 Nos
20.	Volt Meter (Analog)	03 Nos
21.	Volt Meter (Digital)	03 Nos
22.	Ammeter (Analog)	03 Nos
23.	Ammeter (Digital)	03 Nos
24.	Frequency meter(Digital)	03 Nos
25.	Power Factor Meter (Analog)	03 Nos
26.	Power Factor Meter (Digital)	03 Nos
27.	Watt Meter (Analog)	03 Nos
28.	Watt Meter (Digital)	03 Nos
29.	Energy Meter (Analog) 1- ϕ	03 Nos
30.	Energy Meter (Digital)	03 Nos
31.	Energy Meter (3- ϕ , 4 wire)	03 Nos
32.	Taco Meter (Direct touch)	03 Nos
33.	Clip on Meter Tong tester (Digital)	03 Nos
34.	Wire Gauge	10 Nos
35.	Micro Meter	10 Nos
36.	Combination pliers	12 Nos
37.	Long nose pliers	12 Nos
38.	Diagonal cutting pliers	12 Nos
39.	Monkey wrench	12 Nos
40.	Adjustable pliers	12 Nos
41.	Vice Griper	12 Nos
42.	Adjustable Wrench (set)	03 Set
43.	Ceiling Fan	10 Nos
44.	DC Motors	04 Nos
45.	1- ϕ AC- motor	05 Nos

46.	3- ϕ AC- motor	05 Nos
47.	Self starter	05 Nos
48.	Star-delta starter (manual & auto)	05 Nos
49.	Auto transformer starter	05 Nos
50.	Direct on line starter	05 Nos
51.	DC Generator	03 Nos
52.	AC Generator	02 Nos
53.	Hand gloves (dotted)	20 Nos
54.	Safety shoe (insulated)	10 pair
55.	Helmet	20 Nos
56.	Sunglass/Safety goggle	20 Nos
57.	Apron	20 Nos
58.	First aid box with essential items	01set
59.	Safety belt	10 Nos
60.	Dust mask	20 Nos

Raw Materials:

List of Raw Materials required for the 360 hrs MRTC Program:

Sl. No.	Description
01	Flexible cable
02	PVC single core cable 3/20swg, 7/20swg,3/22 swg, 7/22 swg
03	PVC Single Core cable1/18 swg,
04	PVC twin Core cable2x3/20 swg
07	Piano type switch 1 way, 2 way
08	Inter mediate switch
09	Gang switch (2-4 gang)
10	Combined switch socket
11	Piano type 2- pin socket
12	Batten Holder
13	Bracket Holder
14	Pendant Holder
15	Light Bracket
16	Ceiling Rose
18	Two pin plug
19	Three pin plug (round pin)
20	Three pin plug (flat pin)
21	Piano type fuse (cut-out)
22	Tube lamp holder (round type)
23	Tube lamp holder (L- type)
24	Tube lamp holder (3-paces)
25	Tube lamp 20w, 40 w
26	Incandescent lamp 60w, 100w
27	Bulb (Energy save)23w, 30w
31	Blast 20w, 40w
32	Soldering Lead
34	Wooden Screw $\frac{3}{4}$ ''; 1''; 1 $\frac{1}{2}$ ''
35	Machine screw $\frac{3}{4}$;; 1''; 1 $\frac{1}{2}$ ''
38	Drill bit (Twist bit) 5.mm; 6.mm
39	Masonry bit

40	PVC/plastic box 3''x3''; 3''x4''; 4''x6''
41	PVC/Plastic switch box 1 hole, 2 hole, 3 hole, 4 hole
42	PVC/Plastic switch box 5 hole, 6 hole, 7 hole & 8 hole
44	PVC/channel ½'', ¾'', 1'', 1½'',
59	PVC conduit pipe ½'', ¾'', 1'', 1½'',
64	PVC/circular box (1-2-3-4 way)
65	PVC Tee ½'', ¾'', 1'', 1½''
66	PVC elbow ½'', ¾'', 1'', 1½''
68	PVC bend ¾'', 1'', 1½''
69	PVC socket ¾'', 1'', 1½''
70	Saddle ¾'', 1'', 1½''
71	Insulation tape
72	MCCB (tp) 32A, 440v
73	MCB (dp) 16A, 20A 250v
74	MCB (sp) (06 -16A), 250V
75	Rowel plug
77	Fan bearing
78	Earth copper wire 6,8swg
79	Earthing plate 30cmx30cmx.635cm copper
80	Charcoal
81	Salt
82	GI pipe 19mm
83	GI Pipe 12.5mm
84	Earth continuity wire (swg 14&18 no.)
85	Tube light starter
86	Fuse cut out 5A, 10A, 15A
87	Main Switch Single phase 15A, 30A
88	Main Switch three phase 30A, 60A, 100A

Entry Qualification:

Minimum class eight/JSC/JDC or equivalent

Employment Opportunity:

1. Government service
2. NGO's
3. Abroad
4. Self Employment
5. Private company
6. Mills and factory
7. Others (Manufacturing, Construction, Engineering, Fabrication, Repair and maintenance and Technical Education)

Reference book:

01	Basic electrical knowledge	MM khaibar Ali Diploma in Electrical engineering Instructor (Electrical) Technical Training Centre, Mirpur, Dhaka.
02	DC Machine	Sree Shib Proshad Gongo Paddhay, M.I.E.E M.A.E Retired Assistant Professor of Lahore Maklagan Engineering College in electrical engineering and Sree Shudhagshu Shomaddar BEE,MIE Retired Professor of Calcutta Technical School.
03	AC Machine	Sree Shudhangsha Shomadder BEE. MIE. Professor Electrical Engineering, Calcutta Technical School.
04	Electrical installation	Sree Arobindo Podder Anirban prokashon
05	Electrical Wiring	Sammader and Gangopadday Retired Professor of Calcutta Technical School, India

