



BANGLADESH TECHNICAL EDUCATION BOARD

Agargaon, Sher-E-Bangla Nagar
Dhaka-1207

Syllabus for the short course

ON

DIESEL MECHANICS

Total duration 360 hours (3/6 Months)

BANGLADESH TECHNICAL EDUCATION BOARD

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COURSE TITLE

DIESEL MECHANICS

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DIESEL MECHANICS

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 technical (Board/Vocational) curriculum.

In this regard BTEB has approved to conduct diesel mechanics course to various trade/vocational institute. The Syllabus has been prepared as per present need in the job market.

Objective:

1. Covers procedures, processes, equipment and terminology employed in engineering along with related fields. Engineering equipment and industrial safety will be covered.
2. To provide the students with the basic and practical knowledge on Diesel and Petrol Engine.
3. To stress the theory and practical applications on all types of concerned job.
4. To stress the theory and practical application on all types of engines.
5. To stress the theory and practical application on all types of machineries.
6. To stress the theory and practical application of engineering system.
7. To provide the students with the ability to set up maintain and operate all types of engines.
8. For giving dealing idea to the students about engineering drawing, so that they can rectify the engineering faults through the drawings.
9. To emphasize and preparation small projects using drawings
10. To emphasize and teach the students about techniques to work on engineering equipment and machineries.

Course outline:

Name of course	Duration of course		Entry qualification
Diesel Fitter	Total 360 hrs	5 days per week, per day 3 hrs	Minimum eight pass
	Theory 100 hrs Practical 200 hrs Communicative English 60 hrs	Theory = 1 hr Practice = 2 hrs Total = 3 hrs, per working day	

Competencies:

Common competencies:

1. Engine theories
2. Familiarize with all Engines
3. Practice on Engines fault finding
4. Understand Engineering machineries drawing
5. Adopt safety on working Engineering equipment

Core competencies:

1. Enhance skillness in knowing Engineering tools
2. Enhance skillness in knowing Engineering test equipments
3. Enhance skillness in knowing different parts of engines.
4. Enhance skillness in knowing various components of engines.
5. Enhance skillness in knowing all Engineering equipments used in domestic purposes
6. Enhance skillness Dismantling and Assembling of Engines with confidence
7. Enhance skillness to know the techniques for finding out the faults of Engines and rectification with confidence.
8. Enhance skillness in tracing out Engineering diagram

Efficiently communicate in English:

1. Conversation in English with confidence
2. Effectively communicate with target persons
3. Understand the speech of English users
4. Achieve better professional performance

Communicative English 30 hours:

Related subject 10 hours and general subject 20 hours

One hour/period on the completion of this course, trainees will be able to

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

S. No	Topics	Period
1.	Speaking English – Getting information and finding ones way	1
2.	Speaking English – About tools and equipments	1
3.	Speaking English – About meeting some one and participating in class	1
4.	Speaking English – Daily asking about theoretical contents	1
5.	Speaking English – Evening activities and about theoretical contents	1
6.	Speaking English – Meeting at the train station and asking question at the train station	1
7.	Speaking English – About different types of tools, test equipment used in engineering equipment drawing.	1
8.	Speaking English – Getting to the Hotel and Asking direction	1
9.	Speaking English – Asking about buses and traveling by bus	1
10.	Speaking English – About Practical Class	1
11.	Speaking English – Going by Taxi and Asking the time	1
12.	Speaking English – Arriving early or late and time and the calendar	1
13.	Speaking English – About different types of engineering equipments.	1
14.	Speaking English – Living in a Apartment	1
15.	Speaking English – Using telephone	1
16.	Speaking English – About different types of faults developed in engineering equipment.	1
17.	Speaking English – Getting help in stores and talking about shopping	1
18.	Speaking English – Sending and Receiving letters	1
19.	Speaking English – About engineering drawing.	1
20.	Speaking English – Talking about the weather and trips and sight seeing	1
21.	Speaking English – Talking about eating and dinner conversation.	1
22.	Speaking English – Common health problem and quitting and finding jobs.	1
23.	Speaking English – Office details and office conversation.	1
24.	Speaking English – About Practical job.	1
25.	Speaking English – On a specific situation and public speaking.	2
26.	Speaking English – About exchanging view with a person and introducing oneself.	1
27.	Speaking English – Describing and Narrating events, place, object etc.	1
28.	Speaking English – About engineering equipments.	2
		30

Communicative English 30 hours (Practical):

Interpret the meaning of given words (by the teachers) – Vocabulary

Speaking on a specific situation

Public speaking

Exchanging views with target persons

Introducing one self

Describing and narrating events, places, objects etc.

Practical:

Speaking on a specific situation

Public speaking

Exchanging views with target persons

Introducing oneself

Describing and Narrating events, Places, Objects etc.

Producing the meaning of given words (by the teachers) vocabulary

Prepared speech.

Theoretical: Common and core competencies

S. No.	Topics	Period
1	Orientation, History and definition of engine	2
2	Name of Engineering tools and their use	3
3	Various types of measuring tools and there uses	3
4	Heat and temperature and conversion of various scale	1
5	Units of measurement of various system, calculation of HP, PV diagram	1
6	Types of engine and their uses (Diesel and Petrol)	2
7	Working principle of engine	2
8	Difference between diesel and petrol engine	2
9	Main Components of an engine and their function and types :	
	a Cylinder head and its components	1
	b Piston	1
	c Piston ring	1
	d Liner	1
	e Crankshaft	1
	f Camshaft	1
	g Bearing	1
	h Injector	1
	i Fuel pump and its components	1
	j Governor, Types of governor	1
	k Crankcase & Sump	1
10	Difference between 2 and 4 stroke cycle	2
11	Advantage & Disadvantage of 2 & 4 stroke cycle	2
12	Various systems of diesel engine :	2
	a Air induction / Intake system with diagram	1
	b Function of Air induction / Intake system	1
	c Effect of less and more tappet clearance	1
	d Air intake filter	1
	e Supercharging	1
	f Inter cooler / After cooler	1
	g Air intake manifold	1
	h Valve timing	1
13	Fuel system with diagram :	1
	a Function of fuel system	1
	b Types of fuel system	1
	c Fuel filters	1
	d Flash & burring points of fuel	1
	e Dilution and contamination	1
14	Lubricating oil System with diagram :	1
	a Function of lubricating system	1
	b Types of lubricating system	1
	c Properties of lube oil and Object of lubrication	1
	d Lub oil pump and filter	1
16	Cooling system with diagram :	1
	a Function of cooling system	1
	b Types of cooling system	2
	c Heat exchanger	1
	d Fresh water & Sea water pump	2
17	Exhaust system with diagram :	1
	a Function of system	1
	b Scavenging	1
	c Silencer	1
18	Starting & Stopping system :	1
	a Types of starting system	1
	b Advantage/disadvantage of various starting system	1
19	Maintenance :	
	a Types of maintenance for Diesel and Petrol engines.	2
	b Top overhauling/Major overhauling of Diesel and Petrol Engines	2

20	Defect and Rectification :		
	a	Starting and Stopping procedure of diesel engine	2
	b	Causes of engine not taking start	2
	c	Checking and recording of running parameters	1
	d	Engine starts but not taking load	1
	e	Causes of black smoke and remedy	1
	f	Causes of White smoke and remedy	1
	g	Causes of blue smoke and remedy	1
	h	Causes of abnormal sound and remedy	1
	i	Causes of excessive vibration and remedy	1
	j	Causes of piston ring failure and remedy	1
	k	Causes of Low tub oil pressure and remedy	1
	l	Causes of Lub oil temp high and remedy	1
	m	Causes of fresh water temperature high and remedy	1
21	Petrol & Gas engine		
	a	Working principle of Petrol engine	3
	b	Difference between Petrol and Gas engine	3
	c	Function of Carburetor, Sparking Plug and Ignition system	4
	d	Advantage and Disadvantage of Diesel engine over Petrol engine	3
22	Knowledge about fire fighting and personnel safety		2
			100

Practical:

S. No.	Topics	Period
1	Over view of a diesel engine and familiarization of external fitting, their function.	6
2	Familiarization of the systems like Air, Lub oil, Fuel and Cooling system.	6
3	Physically visualize the various parts of engine and various measuring tools and their uses.	10
4	Removing of all external pipelines of various system including fuel pumps.	10
5	Removing both intake and exhaust manifold including filter, silencer.	6
6	Removing and dismantling of cylinder head decarburizing, cleaning and testing for crack or leakage	10
7	Valve grinding / Lapping	6
8	Dismantling of an injector servicing and testing in the bench	10
9	Removing of engine sump, cleaning and inspection	6
10	Disconnect of connecting rod from the crankshaft and withdrawal of piston.	6
11	Removal of piston from piston rings and cleaning and gauging	8
12	Disconnect connecting rod from piston, checking both small and big end bearing and gauging	10
13	Removal of camshaft, inspection and re-fitting	6
14	Removal of main bearings, check for sign of wear and gauging	10
15	Removal of crankshaft, checking for ovality, trueness and refitting	10
16	Removal of gear train, inspection for any abnormality and refitting	6
17	Assembling of connecting rod and piston	9
18	Removal of liner, checking for any defects gauging	10
19	Refitting of liner into the engine block	6
20	Refitting of piston ring into the piston and fitting back in the liner	10
21	Refitting of big end bearing and checking for freeness of crankshaft and piston	10
22	Replace cylinder head and tighten as per sequence	7
23	Refitting of intake and exhaust manifold	5
24	Refitting of fuel pump and injector	5
25	Fitting of all pipe line and prepare the engine for start	4
26	Familiarization with Petrol Engine	4
27	Overhauling and fault finding Petrol engine	4
		200

Engineering tool box:

S. No.	Topics	Denom	Set
1	Opened end spanner	set	1
2	Ring Spanner	set	1
3	Socket/Box spanner	set	1
4	Adjustable spanner	no	1
5	Torque spanner 500lbs/inch	no	1
6	Monkey/Pipe spanner	no	1
7	Ball pin hammer	no	1
8	Malade hammer	no	1
9	Screw driver (Flat/Star)	set	1
10	Plier	no	1
11	Scissor	no	1
12	Circlip extractor	no	1
13	Bearing extractor	no	1
14	File	set	1
15	Chisel	set	1
16	Centre punch	no	1
17	Allen key	set	1
18	Divider	no	1
19	Foot scale	no	1
20	Wire cutter	no	1
21	Drift	no	1
22	Tap/Die with handle	set	1
23	Hack saw	no	1
24	Dial indicator	no	1
25	Copper sheet	lbs	5
26	letter Puncher	set	1
27	Sheet cutter	no	1
28	Tony bar	no	1

Entry Qualification:

Minimum qualification Class Eight pass.

Employment opportunities:

Qualified Diesel mechanics may find lucrative jobs in following areas of marine/industrial establishment in Bangladesh as well as overseas employment market:

- Manufacturing
- Construction
- Engineering
- Fabrication
- Repair and maintenance
- Technical Education
- Inspection

Qualified Diesel mechanics Technician may enter career, such as

- Diesel mechanics in any Mill, Factory or other establishment
- As Diesel mechanics in any marine ship of any country
- May join in any military force where Diesel mechanics required
- May find out the job in any foreign country as Diesel mechanics technician.

Reference of books:

S. No.	Topics
1	Diesel engine machineries – By N K Mongal
2	cÖþkœvĒþi þgwib BwÄb – By Abdul Hoque
3	cÖþkœvĒþi wWþRj BwÄb – By J N Sarker