



BANGLADESH TECHNICAL EDUCATION BOARD

Agargaon, Sher-E-Bangla Nagar
Dhaka-1207

Syllabus for the short course

ON

MACHINIST TRADE

Total duration 360 hours (3/6 Months)

BANGLADESH TECHNICAL EDUCATION BOARD

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COURSE TITLE

MACHINIST TRADE

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MACHINIST TRADE

01. Introduction

Now a day over population is not out curse, also it is a main resource of out country. Man dose not get more than his efforts. For perfect implementing the efforts depend on motivation, proper media and precise field.

There is no alternative for increasing national income and development without standard qualities and value of production of industry and factories, exporting skilled manpower to the aboard which is depend on technical training and related sections. Only Technical (vocational) training can produce skilled manpower by applying good management and modernization of training program. A syllabus has prepared by Bangladesh Technical Education Board on Refrigeration and Air conditioninig-1 for fulfillment of this need,. Right environment and management (like trines, trainers, building, tools and equipments, materials, management etc) are essential for implementing this syllabus. In this case some topics has changed and included form the existing one. Some more and modern topics has included is the new one. Trainees will convert into skilled manpower by proper utilizing this syllabus. Bangladesh Technical Education Board has recognized this syllabus on the 2008 through precise process for converting human resource into skilled man power. After completing this course the trainees achieve that will enable to install, services, maintain, trouble shoot are repair refrigeration and air-conditioning small units.

02. Course outline

name of course	duration of course		entry qualification
Machinist	total 360 hrs	5 days per week, per day 3 hrs	minimum SSC pass Appeared equivalent
	theory 90 hrs practical 240 hrs Speak English 30 hrs	theory 1 hr per lesson practice 2 hrs per practice total 3 hrs working day	

List of competencies

1. Laying out and making
2. Hand hack sawing
3. Filing flat
4. Filing chamfer
5. Drilling through hole (on bench/pedestal drill)
6. Hand tapping though hole
7. Filing round
8. Cutting thread by hand die
9. Turning straight
10. Turning taper
11. Turning shoulder
12. Turning groove
13. Turning chamfer (chamfering)
14. Knurling
15. Parting off
16. Turning face (facing)

17. Centre drilling (on centre lathe)
18. Drilling thorough hole (on centre lathe)
19. Boring (on centre lathe)
20. Sharpening straight turning tool
21. Power hack sawing
22. Drilling blind hole (on bench / pedestal drill)
23. Coordinate drilling (on bench / pedestal drill)
24. Counter sinking (on bench / pedestal drill)
25. Counter boring (on bench / pedestal drill)
26. Shaping square
27. Shaping shoulder
28. Shaping plain / vee slot
29. Milling square (on horizontal / vertical machine)
30. Milling plain slot
31. Milling vee groove
32. Milling spur gear teeth (by rapid indexing)
33. Milling helical gear teeth (by simple indexing)
34. Grinding surface flat
35. Non-precision measuring and checking
36. Precision measuring and checking
37. Reading simple drawing
38. Cleaning machine tools and equipment
39. Lubricating machine tools and equipment.

Trade theory

- 1 Orientation
 - 1 Machinist
 - 2 Machinist trade
 - 3 Machine shop
 - 4 Machine tools

- 2 Safety precautions
 - 1 General
 - 2 Personal
 - 3 Shop/Equipment
 - 4 House Keeping

- 3 Measurement and checking
 - 1 Non-precision
 - 2 Precision

- 4 Non-precision measuring and checking instruments
 - 1 Steel rule
 - 1 Graduations
 - 2 Outside calipers
 - 3 Inside calipers
 - 4 Combination set
 - 1 Components
 - 2 Use
 - 5 Depth gage
 - 6 Try square
 - 7 Screw pitch gage
 - 8 Radius gage

- 5 Precision measuring and checking instruments
 - 1 Micrometers (outside, inside and depth)
 - 1 Graduations
 - 2 Reading
 - 3 Use
 - 2 Vernier (calipers, higher gage and bevel protractor)
 - 1 Graduations
 - 2 Reading
 - 3 Use

- 3 Telescopic gage
 - 1 Range/set
 - 2 Use
- 4 Dial indicator
 - 1 Graduations
 - 2 Reading
- 6 Laying out and marking
 - 1 Application
- 7 Laying out and marking tools
 - 1 Names
 - 2 Uses
 - 3 Auxiliaries
- 8 Reading of drawing
 - 1 Shapes
 - 2 Dimensions
 - 3 Notes and symbols
- 9 Metal
 - 1 Ferrous
 - 1 Carbon steel (low, medium and high)
 - 2 Cast Iron
 - 3 Alloy steels (commonly used)
 - 2 Non-ferrous (commonly used)
 - 3 Commercial forms
 - 4 Important properties
- 10 Hand hack sawing
 - 1 General application
- 11 Hand Hack saw
 - 1 Frame
 - 1 Types
 - 2 Blades
 - 1 Types
 - 2 Selection
- 12 Filing
 - 1 General application
- 13 Files
 - 1 Cut
 - 2 Grade
 - 3 Cross section
 - 4 Length
 - 5 Use of common types
- 14 Hand thread cutting
 - 1 External
 - 2 Internal
 - 3 General application
 - 4 Common thread standards
 - 5 Tap drill size
- 15 Taps and dies
 - 1 Tap set
 - 1 Set members
 - 2 Use
 - 2 Tap wrench
 - 3 Dies
 - 4 Die stock

- 16 Power hack sawing
 - 1 General application
- 17 Power hacksaw
 - 1 Components
 - 2 Controls and settings
 - 1 Name
 - 2 Function
- 18 Drilling operations
 - 1 Drilling
 - 1 Cutting speed and feed
 - 2 Allied operations (common)
- 19 Drilling machine (pedestal)
 - 1 Components
 - 2 Controls and settings
 - 1 Name
 - 2 Function
 - 3 Work holding devices (commonly used)
 - 1 Name
 - 2 Uses
 - 4 Drill mounting devices
 - 1 Name
 - 2 Uses
 - 5 Drill bits
 - 1 Cutting angle
 - 2 Size
- 20 Head tools (commonly used)
 - 1 Name
 - 2 Uses
- 21 Auxiliary materials
 - 1 Name
 - 2 Uses
- 22 Centre lathe
 - 1 Components
 - 2 Controls and settings
 - 1 Name
 - 2 Function
 - 3 Working holding devices (commonly used)
 - 1 Name
 - 2 Uses
 - 4 Cutting tools (commonly used)
 - 1 Name
 - 2 Uses
 - 5 Cutting tool mounting devices (commonly used)
 - 1 Name
 - 2 Uses
- 23 Turning operations
 - 1 Common operations
 - 2 Cutting speed, feed and depth of cut
 - 3 Standard tapers
 - 4 Taper turning set ups
- 24 Shaping operations
 - 1 General application
 - 2 Common operations
 - 3 Cutting speed, feed and depth of cut
 - 4 Stroke length

- 25 Shaper
 - 1 Components
 - 2 Controls and settings
 - 1 Name
 - 2 Uses
 - 3 Work holding devices (commonly used)
 - 1 Name
 - 2 Uses
 - 4 Cutting tools (commonly used)
 - 1 Name
 - 2 Uses

- 26 Off hand grinding
 - 1 General application
 - 2 Lathe tool sharpening
 - 1 Tool geometry
 - 2 Material

- 27 Pedestal grinder
 - 1 Components
 - 2 Controls and settings
 - 1 Name
 - 2 Function
 - 3 Rough and smooth wheels
 - 1 Uses
 - 4 Wheel dressing

- 28 Milling operations
 - 1 General application
 - 2 up milling and down milling
 - 3 Common operations
 - 4 Cutting speed, feed and depth of cut

- 29 Milling Machine
 - 1 Main types
 - 2 Components
 - 3 Controls and settings
 - 1 Name
 - 2 Function
 - 4 Work holding devices (commonly used)
 - 1 Names
 - 2 Uses
 - 5 Cutters (commonly used)
 - 1 Names
 - 2 Uses
 - 6 Cutters mounting devices (commonly used)
 - 1 Names
 - 2 Uses
 - 7 Attachments and accessories (commonly used)
 - 1 Names
 - 2 Uses

- 30 Gear Cutting
 - 1 Types of gears (common)
 - 2 Gear cutter
 - 1 Size
 - 2 Form
 - 3 Indexing
 - 1 Simple
 - 2 Rapid
 - 4 Change gear

- 31 Precision grinding
 - 1 Types

	2	Surface grinding	
	1	General application	
32		Surface grinder	
	1	Components	
	2	Controls and settings	
	1	Names	
	2	Functions	
	3	Magnetic chuck	
	4	Grinding Wheel	
	5	Wheel dressing	
	1	Need	
	2	Diamond dresser	
33		Cutting Fluid	
	1	Necessity	
	2	Types (commonly used)	
	3	Selection	
34		Limit dimensions	
	1	Fits	
	2	Tolerance	
	1	High limit	
	2	low limit	
35		Surface roughness	
	1	Roughness	
	2	Finish machining	
	3	Symbols	
36		Heat treatment	
	1	Annealing	
	1	Application	
	2	Normalizing	
	1	Application	
	3	Hardenin	
	g		
	1	Application	
	4	Tempering	
	1	Application	
	5	Case hardening	
	1	Application	
37		Routine Maintenance	
	1	Necessity	
	2	Cleaning	
	1	Methods	
	2	Tools and auxiliaries	
	3	Lubricating	
	1	Lubricants	
	2	Tools	

TRADE PRACTICAL

1	Orientation	
	1	Demonstration of using controls and settings of machine tools
	2	Demonstration of safety devices of machine tools
2	Bench work	
	1	Nut (laying out and marking, hand hack sawing, filing, drilling, hand tapping etc.)
	2	Stud (Filing, thread cutting by hand die etc.)

3	Lathe work	
1	Centre punch (straight turning, taper turning, shoulder Turning, grove turning, chamfering, knurling, parting etc.)	16
2	Gear blank (straight turning, facing, center drilling, drilling, boring etc.)	16
4	Lathe tool sharpening (Straight turning tool)	8
5	Power hack sawing work (sawing work pieces for various jobs)	3
6	Laying out and marking (on work pieces of shaping, milling etc)	8
7	Drilling work (blind hole, thorough hole coordinate, countersinking etc, drilling can be done on gear blanks)	8
8	Shaping work	24
1	Step block (square, shoulder etc. shaping)	
2	Longitudinal slots on round bar (v or plain slot shaping)	16
9	Milling work	
1	Vee block (square, plain slot, vee groove etc, milling)	36
2	Square milling on two ends of round bar	16
3	Spur gear teeth (by rapid indexing)	24
4	Helical gear teeth (by simple indexing)	28
10	Surface grinding flat (may be done on vee block)	8
11	Routine maintenance (cleaning, lubricating etc, to be performed regularly in each class and also at the end of the week)	8

List of jobs

01. Make a charging line
02. Cutting, disassembling, checking, reassembling and weeding of hermetic (reciprocating and rotary) compressor
03. Disassembling, checking, reassembling of open type compressor
04. Checking pumping performance of different compressor (with and with out service valve)
05. Oil charging to hermetic and open type compressor
06. Clearing and replacing capillary tube
07. Testing and setting thermostatic expansion valve
08. Refrigerant transfer form cylinder to unit and form unit to cylinder
09. Verification of ohm's law and measuring current, voltage and resistance
10. Finding the terminals (run, start, common, high, low etc) of compressor and blower fan motor and connecting terminals with selector switch.
11. Testing Thermostats and relays
12. Testing capacitor and over current protector
13. Testing and terminal finding of timer and selector switches
14. Making and testing Electrical circuit for frost refrigeration, beverage cooler and water cooler.
15. Making and testing electrical circuit for frost refrigerator, beverage cooler and water cooler.
16. Servicing refrigerator, Beverage cooler and water cooler
17. Making and testing electrical circuit for semi – auto (using 3pin thermostat) and automatic using timer) defrosting refrigerator.
18. Making electrical circuit of window type AC and testing procedure of the circuit before supply.
19. Making and testing electrical circuit of spilt type AC and Car AC.
20. Servicing window type AC and split type AC
21. Servicing car type AC
22. Servicing and Repairing of Fan and Pump.
23. Evacuation and charging of refrigerator and water cooler with charging station.
24. Evacuation and recycling refrigerant of a window, split type AC and car AC with refrigerant recovery machine.

Entry qualification

01. SSC appeared/equivalent

Employment opportunity

01. Government service

- 02. Semi Government service
- 03. Corporation
- 04. Private sectors
- 05. NGO
- 06. Abroad
- 07. Self employment

Book reference