

GOVERNMENT OF THE PUNJAB

**TECHNICAL EDUCATION & VOCATIONAL
TRAINING AUTHORITY**



CURRICULUM FOR

TRACTOR OPERATOR

(6 – MONTH COURSE)

Revised January, 2009

**CURRICULUM SECTION
ACADEMICS DEPARTMENT**

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TRAINING OBJECTIVES

Pakistan is an agricultural country. Tractor is one of the main farm mechanization machines which are in wide use in all parts of the country.

This course aims at training semi skilled manpower, who could operate tractor efficiently with safety for various agricultural requirements.

CURRICULUM SALIENTS

Entry Level	Primary Pass
Duration of course	6 – Months
Total Training Hours	800 Hours
	40 Hours per Week
	7 Hours per day except
	Friday (5 Hrs.)
	6 Day in Week
Training Methodology	Practical 80%
	Theory 20%
Medium of Instruction	Urdu / English

- One Hour per Week for Work Ethics

SKILL PROFICIENCY DETAILS

On successful completion of the course, trainee should be able to:

1. Qualify as a tractor operator and get a driving license.
2. Operate a tractor efficiently with all essential implements by observing necessary precautions and driving rules.
3. Perform skillfully field operation with the tractors and implements
4. Be able to maneuver farm trolley, with desired safety.
5. Selection and use of workshop tools correctly, properly and carefully.
6. Able to remove minor faults in tractor such as, removing wheels, removing tyres and mending of flatted tube and removing of air lock.
7. Perform the routine maintenance and periodic servicing of farm tractors.
8. Install and remove tractor implements with three points linkage.
9. Know procedure to maintain the battery and electric system.
10. Know the adjustment for change of V-belt.
11. Able to maintain the tractor Logbook.
12. Know the first aid and safety measures during practical work.

KNOWLEDGE PROFICIENCY DETAILS

On successful completion of the course, trainee should be able to:

1. Tractor and its importance.
2. Farm implements and their importance in the field.
3. Traffic rules and regulation and road safety.
4. Major components of the tractor and their functions.
5. System of tractors.
6. Periodic maintenance of tractors and its importance.
7. Maintenance and cleanliness of implements after use.
8. Selection of proper tools and materials for tractor maintenance.
9. Safety precautions in the use of tools, equipment 's farm machinery.
10. Importance of writing logbook.
11. Dashboard appliance / instruments indications.
12. Care of battery and electric system.

CURRICULUM DELIVERY STRUCTURE

	Course Delivery	Make up Session	Revision	Co Curricula Activities / Vacations	Final Test	Total
Week	1-20	21-22	23-24	25	26	26
	20	2	2	1	1	

SCHEME OF STUDIES**Tractor Operator
(6 – Month Course)**

Sr. No.	Subjects / Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Introduction & importance of farm tractor and farm implements	24	-	24
2.	Various types of Tractor	18	-	18
3.	Identification of various parts of Tractor	-	48	48
4.	Use of hand tools and safety precautions	8	32	40
5.	Dash board panel	4	-	4
6.	Driving practice of Tractor	-	60	60
7.	Knowledge of Road signs +Traffic Rules.	8	-	8
8.	Object of agriculture: machinery	18	-	18
9.	Three point linkage. Its categories object and advantages	20	80	100
10.	Method of hitching various implements safety precautions while hitching	12	48	60
11.	Driving of tractor with implements	-	100	100
12.	Maintaining of Tractor logbook	8	-	8
13.	Systems of Tractors	25	100	125
14.	Maintenance of Tractor Study maintenance of manual of Tractor	15	60	75
15.	Land leveling equipments practical use of land leveling equipment precision land leaving	-	40	40
16.	Functional English	-	40	40
17.	Industrial Study Tour (Two)	-	12	12
18.	Work Ethics	-	20	20
Total		160	640	800

DETAIL OF COURSE CONTENTS**Tractor Operator
(6 – Month Course)**

Sr. No.	Topics	Theory Hours	Practical Hours
1.	Introduction and importance of Farm tractors.	24	-
2.	Various types of tractors. 2.1. Various makes and types of tractors, Model, HP rating, Fuel consumptions, Cost, and availability of spare parts and maintenance facilities.	18	-
3.	Identification of various parts of tractors.	-	48
4.	Use of hand tools and safety precautions.	8	32
5.	Dash board instruments gauges / Meters	4	-
6.	Driving tractors in low and high gear. 6.1. Shifting of gears up and down. 6.2. Driving round the corner and reverse driving. With and without trailers.	-	60
7.	Knowledge of Road Sign + Traffic Rule	8	-
8.	Object of Agri Machinery	18	-
9.	Three point linkage, its categories objects & advantages	20	80
10.	Method of Hitching Implements & safety precaution during Hitching	12	48
11.	Driving of Tractor with implements. 11.1. Grader - cultivators - MB plough 11.2. Disc plough – Harrows – Rotavators Border Disc. 11.3. Ridgers – Ditchers. Post-hole diggers. 11.4. Fertilizer spreaders, sowing implements hoeing, spraying their calibration and adjustment. 11.5. Moving Threshers implements attachment with tractors. 11.6. Driving of tractor with Trailers F/Rev.	-	100

12.	Maintaining of tractor Log Book.	8	-
13.	Systems of Tractors 13.1. Fuel system, fuel tank, lift pump, fuel filter, injection pump, injectors 13.2. Lubrication system splash system, pressure feed system, splash and pressure valve, and oil pressure gauge. Identification, adjustment and lubrication of different parts of tractors. Flushing the engine (diesel ratio mobil oil 1:3) or flushing agents lubricating oil test (by heat, shaking, litmus paper). 13.3. Cooling system radiator, fan, fan belt pressure cap, water pump, water jacket, and thermostat. Valve / flushing radiator & jackets by (soda 1kg, 1.5 kg, potash, 10 ltrs water) 13.4. Electrical system, battery, generator, self- starter, regulator cut out, lights, relay 13.5. Indicating gauges, oil pressure gauge, engine temperature gauge, ampere meter, fuel gauge, all dash board gauges & indicators lights, fuses and tracing of faults, meter, fuses and tracing of faults. 13.6. Transmission of power. Clutch, gears, differential, final driver, P.T.O shaft 13.7. Brake & hydraulic system, pedals fluids, disc, and hydraulic linkages 13.8. Pre-start check of tractor. Tyre pressure, oil, fuel, neutral gear, charging battery connections, water in radiator, breaks etc.	25	100
14.	MAINTINANCE OF TRACTOR: 14.1. Study of maintenance manual of Tractor. 14.2. Daily (10 hours) service cleaning air cleaner,	15	60

	<p>checking oil level. Cooling system cleaning & lubrication of various parts.</p> <p>14.3. Weekly (50 hours) service, steering, clutch, lubrication, hydraulic system oil check and battery checking free paddle play in brakes.</p> <p>14.4. Monthly (100 hours) service.</p> <p>14.5. Maintenance, adjustments and operation of tractor in the field.</p>		
15.	<p>LAND LEVELING EQUIPMENT:</p> <p>15.1. Landscaper, (Wheel type) its linkage and use, Laser land leveler equipments and laser technology</p> <p>15.2. Land planner (Steel) its linkage and use.</p> <p>15.3. Practical use of land leveling equipment.</p> <p><u>PRECISION LAND LEVELING:</u></p> <p>15.4. Definition, advantages of precision land leveling, difference between rough and precision land leveling, economical use of irrigation water. Land leveling by laser technology.</p> <p>15.5. Laser Land leveling / Laser Technology</p>	-	40
16.	Functional English	-	40
17.	Industrial Study Tour (Two)	-	12
18.	Work Ethics	-	20
Total		160	640

LIST OF PRACTICALS

a. PRACTICAL ON THE ROAD

1. Driving practice, Reverse and Forward, in low and high gears with attachments and with out attachments on & off the road.
2. Driving practice, Reverse and Forward, in low and high gears with single wheel trailer & 4-wheel trailer.
3. Day and night driving practice, on the road with observing traffic rules & regulations of high way code and road signs.
4. Raging & Parking driving practice.

b. PRACTICAL IN THE FIELD

1. Hitching and De-hitching of Agriculture Machinery/ Implements with Tractor
2. Adjustment and Operation of Farm Implements in the field such as: -
Cultivation, Ploughing, Leveling, Sowing, Hoeing, Planting, Drilling, Ridging, Ditching, harvesting, Threshing.
3. Use of Spreaders, Sprayers, Sub-soilers, Water pumps, and other farm implements.

c. PRACTICAL IN THE WORK-SHOP

1. Introduction/identification of (i) Farm Machinery / Implements (ii) Work-Shop Tools (iii) Tractor and its major parts.
2. Practically start & stop the Tractor with proper procedure.
3. Maintained the logbook of Tractor.
4. Use of tools properly and correctly with safety pre-cautions.
5. Maintenance of hand tools & Farm Implements.
6. Exercise for periodic service such as: - Daly, weekly, Monthly, and Maintenance of Tractor.
7. Practically small repair of Tractors such as: - Lifting Tractor by Jack, Removing Air lock, checking Engine oil level and air pressure in the tiers, cleaning filters.

8. Removing tyre from the rim and mending of flatted tube.
9. Replacement of V-belt,
10. Calibration of grain drill / seed drill, practice hydraulic control levers, adjustment of brake and clutch etc.
11. Reading dash board instruments, care of battery,

LIST OF TOOLS AND EQUIPMENT
(FOR CLASS OF 25-STUDENTS)

Name of Trade	Tractor Operator
Duration of Course	6 – Months

Machinery

Sr. No.	Nomenclature of Equipment/ Tool	Quantity
1.	Tractor flat 480 & 640	2 Nos.
2.	Tractor MF 375 & MF 240, 385	2 Nos.

Implements

Sr. No.	Nomenclature of Equipment/ Tool	Quantity
1.	Four Wheel Trailer	1 No.
2.	Two Wheel Trailer	1 No.
3.	Mould Board Plough	1 No.
4.	Disc Plough	1 No.
5.	Grain Drill Machine / Seed Drill Machine	1 No.
6.	Cotton Drill Machine	1 No.
7.	Fertilizer Spreader	1 No.
8.	Spring Loaded Cultivator	1 No.
9.	Spring tine cultivator.	1 No.
10.	Rotavator	1 No.
11.	Rigger	1 No.
12.	Scraper	1 No.
13.	Ditcher	1 No.
14.	Disc Harrow	1 No.
15.	Sub Soiler	1 No.
16.	Leveler	1 No.
17.	Wheat Thresher	1 No.

Teaching Model

Sr. No.	Nomenclature of Equipment/ Tool	Quantity
1.	Tow Stroke (Petrol Engine)	1 No.
2.	Four Stroke (Petrol Engine)	1 No.
3.	Diesel Engine Model Two Stoke	1 No.
4.	Four Stroke (Four Stroke Diesel Engine)	1 No.
5.	Gear Box Model	1 No.
6.	Mechanical Brake Model	1 No.
7.	Hydraulic Brake Model	1 No.
8.	Steering Model With Stand	1 No.
9.	Complete Main Axle Model With Stand	1 No.
10.	Fuel Injection Pump Model	1 No.
11.	Teaching Chart	15 Nos.
12.	Advisory Chart	15 Nos.

Workshop Tools

Sr. No.	Nomenclature of Equipment/ Tool	Quantity
1.	Air Compressor Machine fix & portable.	1+1
2.	Pedestal	1
3.	Work Bench.	6
4.	Bench Vice.	6+6
5.	Grip Vice.	6
6.	Hydraulic Jack.	4
7.	Mechanical Jack.	4
8.	Support Stand.	8
9.	Portable Electric Welding Plant.	1
10.	Electric Hand Drill Machine.	1
11.	Electric Drill Machine with bench.	1
12.	Tyre Opening Machine.	1

13.	Atomizer Tester.	1
14.	Bench Lever sheer (small).	1
15.	Hand Grinder.	1
16.	Assembling Crane	1
17.	Anvil (big & Small).	2
18.	Surface Plates (Small).	1
19.	Search Light.	1
20.	Grease Gun (hand).	6
21.	Grease Gun (pedal Type).	2
22.	Oil Gun.	2
23.	Oil Can.	6
24.	Oil Tray Different Size.	6+6
25.	Jerry Can	6
26.	Measure Container (1/4,1/2,2.5Ltr).	5
27.	Paint Gun.	2
28.	Hydrometer.	2
29.	Filling Dropper.	2
30.	Battery Dropper.	2
31.	Battery Terminal Puller.	4
32.	Wheel spanner.	4
33.	Sledge spanner.	2
34.	Hammer (One KG).	2
35.	Hammer (Two KG).	2
36.	Ball pen Hammer.	2
37.	Rubber Hammer or Plastic Hammer	4
38.	Steel rule.	12
39.	Scrapers.	12
40.	Vernier Caliper (Inch &mm).	6
41.	Micrometer Different Size (Inch & mm).	8
42.	Oil Pressure Gauge	3

43.	Tachometer.	2
44.	Measuring Cloth tape (50 Meter).	2
45.	Air Pressure Gauge.	4
46.	Tyre Lever.	6
47.	Pipe Cutter.	3
48.	Pipe Vice.	1
49.	Pipe Die.	1
50.	Thread Die set (Inch).	2
51.	Thread Die set (mm).	2
52.	Thread Tap set (Inch).	2
53.	Thread Tap set (mm).	2
54.	Socket spanner 'T' Handle.	2
55.	Socket spanner Ratchet Handle.	2
56.	Socket spanner Universal Handle.	2
57.	Extention Rod.	2
58.	Power Rod.	2
59.	Adjustable Wrenches (6").	6
60.	Adjustable Wrenches (12").	6
61.	Torque Wrenches.	2
62.	Pipe Wrenches.	2
63.	Chain/Strap Wrenches.	2
64.	End Puller Set.	2
65.	C-Clamp (Different Type).	4
66.	Bearing Puller.	5

Toolkit

Sr. No.	Nomenclature of Equipment/ Tool	Quantity
1.	Open end Spanner Set (6-32 mm)	6 (Set)
2.	Open end spanner set (inch type)	6 (Set)

3.	Ring Spanner Set (6-32 mm)	6 (Set)
4.	Ring Spanner Set (inch type)	6 (Set)
5.	Allen Key Socket Spanner set (mm)	6 (Set)
6.	Allen Key Socket Spanner Set (inch)	6 (Set)
7.	Socket Spanner Set (mm)	6 (Set)
8.	Socket Spanner Set (inch)	6 (Set)
9.	Hammer Small	6
10.	Combination Pliers	6
11.	Out Side Ring Pliers	6
12.	Inside Ring Pliers	6
13.	Long Nose Pliers	6
14.	Front Cutter Pliers	6
15.	Side Cutter Pliers	6
16.	Grip plier	6
17.	Rough flat file	6
18.	Square file	6
19.	Fine Flat File	6
20.	Round File	6
21.	Scraper Flat	6
22.	Scraper (spoon type)	6
23.	Scraper (three corner)	6
24.	Center punch	6
25.	Drift punch	6
26.	Hand hack saw frame (300 mm)	6

27.	Chisel	6
28.	Flat screw driver	6
29.	Phillips screw driver	6
30.	Spring pliers	6
31.	Tool box	6

MINIMUM QUALIFICATION OF TEACHER

1. B.Sc. Agri Engineering (with 5 Year Experience)

OR

2. DAE in Auto & Farm Machinery (with 5 Year Experience)

Matric with two year Certificate of:-

3. Tractor & Auto Farm Mechanic
4. Auto & Farm Machinery
5. Auto Diesel Mechanic

With 10 Year experience

FOR PRACTICAL STAFF

6. Shop Assistant / Assistant Mechanic / Helper / Tractor Driver (with 5 Year Experience)

REFERENCE BOOKS

1. Tractor ki Dekh Bhal aur Muramat
2. Farm Machinery aur Zari Alat
(Intermediate Unit 1-9, AIOU)
3. Tractor ka Istamal aur Dekh Bhal
4. Zari Alat wa Dekh Bhal (Regional Agriculture Economic Development Center)
5. Auto Mechanics, AIOU
6. A Guide to Tractor Operation and Maintenance, Rao EGA, Asia Publications House, London

EMPLOYABILITY OF PASS OUTS

The pass-out of this course will be able to work in the following areas / Positions.

1. Work as Employed Tractor Driver with Progressive Farmers / Land Owners.
2. Employment in Different Organizations such as Govt. Departments, Municipal Administration
3. Karkhana Alat-i-Zari, Bahawalpur
4. Bahawalpur Rural Development Project, Bahawalpur (Cholistan)
5. Thal Development Authority & Engineering Workshop Layyah / Bakkar
6. Alghazi Tractor Ltd, DG Khan
7. Millat Tractor Ltd, Lahore
8. Alghazi Tractor Service Center, Multan
9. Millat Tractor Service Center, Lahore & Multan