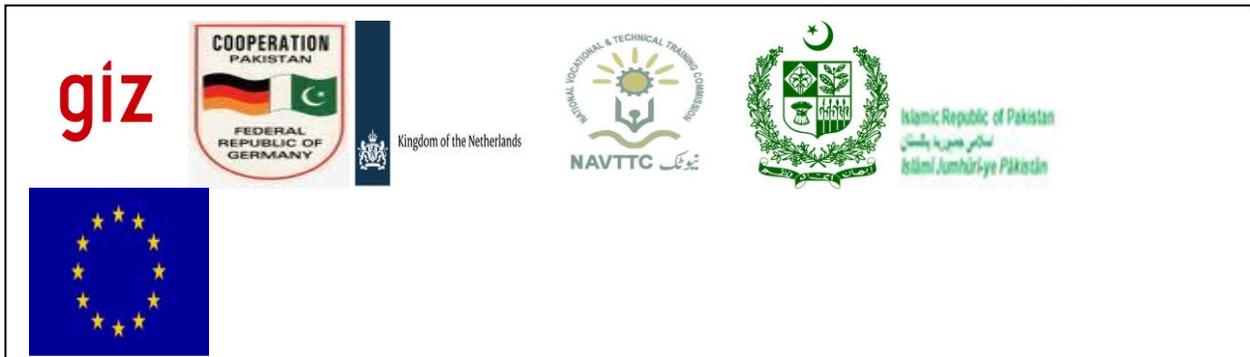


CURRICULUM FOR COTTON GINNING PLANT OPERATOR

6-MONTHS
(Certificate course)

National Vocational & Technical Training Commission, Islamabad (February, 2012)



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TRAINING OBJECTIVES

This course aims at producing skilled manpower which can operate the cotton ginning plant / machinery along with its routine repair and maintenance, besides its seasonal over-hauling.

The major objectives are to:

- Process the raw cotton
- Separate cotton lint from cottonseed
- Organize and supervise the technical workforce
- Operate and carry out repair & maintenance of cotton ginning machines

CURRICULUM SALIENT POINTS

Entry Level	:	Matric (Candidates with science will be given preference)
Duration	:	6-Months
Weekly contact hrs	:	40 Hrs per week
	:	7 Hours / Day (Friday 5 Hrs)
Training Hours	:	800 Hrs
Training Methodology	:	Theory 20%
	:	Practical 80%
Medium of Instruction	:	Urdu / English

SKILL PROFICIENCY DETAILS

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

1. Observe safety rules and precautions relating to ginning machinery.
2. Use efficient handling of tools and gauges.
3. Carry out stripping, assembling and disassembling of various machine elements of ginning plant machinery.
4. Perform various adjustments and calibrations required in the ginning plant machinery.
5. Replace gin saws & ribs and their adjustments
6. Execute proper fixing of suction and delivery fans, valves, duct lines and adjust their pressures.
7. Carry out adjustments, routine maintenance repair & overhauling of following ginning machinery: -
 - i. Rock Catcher
 - ii. Separator
 - iii. Trash Master
 - iv. Inclined Cleaner
 - v. Stick Machine
 - vi. Screw and Belts Conyers
 - vii. F.E.C (Feeder Extractor Cleaner)
 - viii. Gin stand / Saw Ginning Machines.
 - ix. Lint Cleaner
 - x. Condenser
 - xi. Humidifier
 - xii. Lint Slide, Pusher And Tramper
 - xiii. Pump unit, Hydraulic Press
 - xiv. Bailing Unit, Weighing Machine etc.
8. Operate cotton Ginning Machinery / Plant

KNOWLEDGE PROFICIENCY DETAILS

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

1. Identify the safety precautions and measures
2. State the basic knowledge of cotton ginning process and its various aspects.
3. Categorize the semi precision measuring tools, gauges, relating to length, angles, pressure and gaps clearance.
4. Use the workshop items tools and machine parts, mounting and dismounting of bearings, gears, pulleys and sprockets etc.
5. Spot the Air and Hydraulic pressure
6. Define the Suction and delivery fans
7. Describe the Duct lines for cotton shifting
8. Elaborate the Function of rock catcher
9. Explain the Function of separator
10. State the Function of inclined cleaner
11. Figure out the functions of stick machine
12. Classify the Function and types of conveyors
13. Characterize Method of cotton cleaning
14. Describe the function and standardized setting of gin saws (teeth) of ginning machine
15. Exhibit the function of condenser, lint slide, humidifier, pusher and tramper
16. Describe the function of pumping unit, hydraulic oil and hydraulic press
17. Illustrate the bailing unit
18. Define the application of measures of cotton quality control

CURRICULUM DELIVERY STRUCTURE

	Course Delivery	Internship	Co Curricula Activities / Vacations	Test	Total
Week	1-19	20-21	22-25	26	26
	19	2	4	1	

SCHEME OF STUDIES Cotton Ginning Plant Operator (6 - Months Course)

Sr. No.	Main Topics	Theory Hrs	Practical Hrs	Total Hrs
1.	Introduction of Workshop, Tools and Safety Measures.	08	20	28
2.	Introduction to Ginning & Ginning Processes	18	45	63
3.	Ginning Machinery model layout operational & Maintenance requirements	35	94	129
4.	Suction & Delivery Module	10	62	72
5.	Cleaning Module	16	94	110
6.	Separator Module	12	38	50
7.	Conveyer system	5	20	25
8.	Saw Ginning Machine	31	152	183
9.	Humidifier	4	10	14
10.	Bailing & Packing Unit	6	25	31
11.	Processing of by Products	10	16	26
12.	Fiber & Quality of fiber / lint	5	24	29
13.	Internship in a Ginning factory	0	40	40
	Total	160	640	800

DETAILS OF COURSE CONTENTS

Cotton Ginning Plant Operator
(6 Months Course)

Sr. No.	Detail of Topics	Theory Hrs.	Practical Hrs.
1.	Introduction of workshop, tools and Safety measurements 1.1. Workshop, workplace 1.2. Characteristics of metal 1.3. Use of workshop tools / measuring tools 1.4. Safety measurement	2 2 2 2	20
2.	Introduction to ginning and ginning processes 2.1 Introduction to ginning operation, its requirements & essentials. 2.2 Modernization in ginning processes, induction of special equipment to improve their working efficiencies. 2.3 Common standard types of ginning processes used in Pakistan i.e. roller ginning, saw ginning etc. 2.4 Description of roller ginning process, its merits & demerits, limitations. 2.5 Explanation of saw ginning process, its merits demerits, preferences 2.6 Compare saw ginning processes & roller Ginning processes.	3 3 3 3 3 3	5 10 5 10 10 5
3	Ginning Machinery Model layout & its operational maintenance requirements 3.1 Describe the flow diagram of a ginning process & equipment. 3.2 Types of maintenance i.e. routine, periodic & scheduled maintenance. Special overhauling, emergency repair etc.	3 5	12 12

	3.3	Daily, weekly & monthly checking of shafts, bearings & oil level of various points etc.	1	4
	3.4	Seasonal maintenance & overhauling of ginning plant/machinery/equipment.	3	12
	3.5	Basic Machine elements and their parts, assembling-disassembling i.e. shaft & pulleys gears, sprockets & chains, their types & fitting techniques, use of gear puller etc.	3	12
	3.6	Definition of bearing, functions of bearing & their common types.	4	4
	3.7	Numbering system of ball & roller bearings.	4	4
	3.8	Techniques of Mounting & dismounting of bearings on shafts – practice.	4	12
	3.9	Definition & function of lubricants. Types of lubricants i.e. oils and grease etc.	4	6
	3.10	Methods and schedule of lubrication, equipment used for lubrication, importance.	4	16
4	Suction & Delivery Module			
	4.1	Introduction of suction module & delivery modules.	1	4
	4.2	Detailed description of parts of duct lines	1	5
	4.3	Stripping & assembling of duct lines and valves.	1	10
	4.4	Commonly occurring faults in suction and delivery module.	1	6
	4.5	Diagnosis & trouble shooting of faults / problems, air pressure & speed of air in both modules.	1	6
	4.6	Functions of suction module.	1	4
	4.7	Function of delivery module.	1	4
	4.8	Stripping, greasing & assembling of fans motors	2	20

	4.9 Standard sizes of ducts / pipes i.e. dia, length, thickness. Study & type of joints & valves etc.	1	3
5	Cleaning Module		
	5.1 Define contamination.	1	3
	5.2 Types of contamination in seed cotton i.e. leaves, trash, sticks, bowls, (sangli), balls (tenda), dust, stones & other solid / foreign materials etc.	1	7
	5.3 Requirements of cleaning seed cotton.	1	6
	5.4 Stages of cleaning seed cotton i.e. pre ginning, post ginning.	1	6
	5.5 Methods of cleaning / removing contaminations form seed cotton i.e. i) Manual cleaning ii) Automatic Cleaning	1	5
	5.6 Machinery / equipment used for cleaning seed cotton.	1	6
	5.7 Description of each cleaning module.	1	4
	5.8 Description and detailed study of the working of rock catcher. Spreading machine / platform	1	6
	5.9 Description of flat cleaner.	1	3
	5.10 Description of inclined cleaner.	1	8
	5.11 Comparison of flat cleaner & inclined cleaner performance.	1	10
	5.12 Description of trash master cleaner.	2	10
	5.13 Study of working of hot air cleaner.	1	4
	5.14 Dust collection systems i.e. cyclones, chutes, dust collection rooms etc.	1	8
	5.15 Study of the function and working of a dragon machine.	1	6
6	Separator Module		
	6.1 Explain the working of separator.	3	12

	6.2	Description of cleaning rollers & guides of the separator, adjustments & assembling – disassembling etc.	3	12
	6.3	Description of stick machine.	3	6
	6.4	Functions of the Feeder Extractor Collector (FEC).	2	4
	6.5	Study of general feeder.	1	4
7	Conveyor System			
	7.1	Types and working of conveyers systems.	2	5
	7.2	Types, materials & sizes of belt conveyers.	1	5
	7.3	Study of screw conveyors, their size and efficiency.	1	5
	7.4	Comparison and explanation of the working and efficiency of belt conveyors and screw conveyers.	1	5
8	Saw Ginning Machine			
	8.1	Description of saw ginning machine and its major parts.	5	24
	8.2	Describe the function of the discs in saw ginning.	5	20
	8.3	Mounting of Gin saws on the shaft, their balancing and standard gap adjustment.	5	20
	8.4	Description of teeth in saw ginning.	3	20
	8.5	Reasons for damage of teeth, no. of saws on a shaft, saws speed, clearance between saw to saw and clearance between saw to saw and saw to ribs. Saws straightening	3	20
	8.6	Description of ribs, their sizes, angles, adjustments of side clearances between saws & ribs etc.	3	20
	8.7	Define Air Nozzles- Air flew pipes	3	10
	8.8	Function of cotton lint cleaner, its major parts	3	15

	and adjustments. 8.9 Calibration of R.P.M	1	3
9	Humidification in cotton ginning 9.1 Requirement of humidification of cotton and its effects. 9.2 Control of moisture contents in cotton lint. 9.3 Methods of humidity test.	2 1 1	4 4 2
10	Bailing and Packing Unit 10.1 Define the baling unit and hydraulic press. 10.2 Cotton cloth warping, wire packing of bales – its effects 10.3 Function of lint slide – common problems 10.4 Description of pusher 10.5 Working of tramper – It's timing with the pusher. 10.6 Study of weighing units / machines, its types. Standard weight of the bales.	1 1 1 1 1 1	5 5 3 3 6 3
11	Processing of By-Products 11.1 Cotton Seed expelling, study of expeller etc. 11.2 Cotton Seed cake 11.3 Cotton Seed Oil 11.4 Cotton Bowl (Sangli), Waste cotton dust etc.	3 2 2 3	3 3 3 7
12	Fiber & Quality of Fiber / Lint 12.1 Basic & brief study of qualities of cotton lint / fiber. 12.2 Various tests of cotton staple / fiber 12.3 Common defects induced in cotton lint during the ginning process to the required standards.	1 2 2	10 7 7
13	Internship in ginning factory	0	40
TOTAL		160	640

List of Machinery / Equipment (For the Class of 25 Students)

The following machinery / equipment etc. would be required for the effective and comprehensive training of the trainees at the institute level, their timely modifications, improvements and innovations are also recommended. Miniature sectional working models of plants machinery/ equipment are preferred.

Sr. No.	Nomenclature of Equipments / Tools	Quantity	Description
1	Seed Cotton Cleaning And Ginning Plant	One complete set	Model
2	Condenser along with all accessories	1	Model
3	Cleaning module consisting on: -	1	Model
	i. Rock catcher with all accessories of different nos.	1	Model
	ii. Separator (with Vacuum Box) and all accessories	1	Model
	iii. Flat cleaner	1	Model
	iv. Incline cleaner with all accessories.	1	Model
	v. Stick machine with all accessories	1	Model
	vi. Feeder extractor cleaner (FEC)	1	Model
	vii. Belt conveyer with all accessories	2	Model
	viii. Screw conveyer with all accessories	2	Model
	ix. Dust collector (Cyclone)	1	Model
	x. Lint cleaner	1	Model
	xi. Fan / blowers	2	Model
	xii. Ducts	10	Model
	xiii. Plate valves	10	Model
	xiv. Dragon machine	1	Model
	xv. Suction Fan with all accessories	1	Model
	xvi. Trash Master	1	Model
xvii. Hot air cleaner	1	Model	

4	Ginning Module		Model
	i. Saw ginning machine (Gin stand) with all accessories of different nos. and spare parts.	1	Model
	ii. Gin saws	20 Nos.	Model
	iii. Ribs (various sizes and designs)	40 Nos.	Model
	iv. Roller ginning machine	1Nos.	Model
5	Packing Module		Model
	i. Hydraulic press	1 set	Model
	ii. Hydraulic pump station	1No.	Model
	iii. Baling unit	1 set.	Model
	iv. Weighting unit	1 set.	Model
6	Over Head Crane -5 Ton	1 No.	Model
7	Fork Lifter -5 Ton	1 No.	Model
8	Pillar Type Drill Machine	2Nos.	Model
9	Pedestal Grinder	2Nos.	Model
10	Power Saw Machine	1 No.	Model

List of Tools
(For the Class of 25 Students)

Sr. No.	Nomenclature of Equipments / Tools	Quantity
1	Bearing Puller 8", 10", 12"	5 each
2	Tools box (steel) 10" x 18"	25 Nos.
3	Steel rule 12"	25 Nos.
4	Screw driver set 4" 5" 6" 8" 10" 12"	25 Nos.
5	Phillips screw driver set 4" 5" 6" 8" 10" 12"	25 Nos.
6	Combination pliers set	05 Nos.
7	Allen key set	25 Nos.
8	Open ended spanner set	25 Nos.
9	Ball peen hammer 200g, 300g, 500g	25 each
10	Gross peen hammer 200g, 300g, 500g	25 each
11	Mill file 10", 12"	25 each
12	Square file 10" , 12"	25 each
13	Needle file set	25 Nos.
14	File brush	25 Nos.
15	Oil can ¼ Liters	25 Nos.
16	Hand vice 3" , 2"	25 each
17	Vernier caliper 150mm	25 Nos.
18	Adjustable wrench 8", 10", 12"	25 each
19	Round file 10", 12"	25 each
20	Half round file 10", 12"	25 each
21	Triangle file 10", 12"	25 each
22	Counter sink 2#, 3#, 4#	25 each
23	Twist drill set 12mm	12 Nos.
24	Micrometer (mm) 0-25 mm	10 Nos.
25	Micrometer (inch)0-1"	10 Nos.
26	Scribers 8"	25 Nos.
27	Safety goggle	25 Nos.
28	Grinding wheel dresser with holder	05 Nos.

29	Bench vices 5"	12 Nos.
30	Surface plate 24" x 24"	02 Nos.
31	Work bench 4'x8'	06 each
32	Hand shear 12",18"	06 each
33	Riveting gun	05 Nos.
34	Numbering Punch Sets	12 Nos.
35	Lettering punch set	12 Nos.
36	Portable hand disk grinder	04 Nos.
37	Try square 6",8",10"	10 each
38	Combination set 8" 10"	10 each
39	Steel divider 8" 10" 12"	25 each
40	Portable electric hand drill mc. 12mm	04 Nos.
41	Tap set up to M20	10 each
42	Die set up to M20	10 each
43	Hack saw 12"	25 Nos.
44	Hacksaw blade 12" (single)	100 Nos.
45	Hacksaw blade 12" (double)	100 Nos.
46	Pressure dial gauge (bar/psi)	04 Nos.
47	Tap set up to 3/4"	10 each
48	Die set up to 3/4"	10 each
49	Pedestal grinder 10"	02 Nos.

MINIMUM QUALIFICATION OF TEACHER / INSTRUCTOR

1. B.Sc. Engineering / B.Tech (Honors) / *Textile*/ Mechanical First Division with one year industrial experience preferably in textile industry.

OR

2. Diploma of associate engineer in Mechanical Technology First Division with 4 years industrial experience preferably in textile industry.

OR

3. Two years Certificate of Cotton Ginning (GII Level) / General Fitter (GII Level) with 6 years industrial experience including two years experience in textile industry.

LIST OF CONSUMABLE ITEMS

1. Different varieties of Seed Cotton
2. Cotton Waste
3. Lubrication Oil
4. Grease
5. Kerosene Oil

EMPLOYABILITY OF PASS OUTS

The pass outs of this course may find jobs / employment in the following sectors / areas:

- Cotton ginning factories
- Cotton ginning machinery manufacturing industries
- Ginning machinery workshops

RECOMMENDED BOOKS

- Handbook of textile fibers by J. Gordon Cook. 1984.
- Cotton ginner's handbook by W.S Anthony, 1994
- Ginning cotton, An Entrepreneur's story by A.L. Vandergreff, 1997
- The cotton gin(inventions that shaped the world)by Nancy Robinson Masters, 2006
- Cotton Ginning (Textile Progress) by Indra Doraiswamy, 1993.

TTC Series Books:

- Basic Training (Metal, Electrical & Auto Trade)
- Trade Training I (Fitter General)
- Trade Training II (Fitter General & Millwright)
- Trade Training III (Fitter General & Millwright)

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