SYLLABUS – MECHANIC AGRICULTURAL MACHINERY			
FIRST YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Applysafe working practices complying environment regulations and housekeeping in an automotive workshop following safety precautions.	1. Identify workshop & machineries used in trade. (8 hrs.) 2. Familiarization with institute, Job opportunities in the automobile sector. (7 hrs.) 3. Perform different types of work done by the studentsin the shopfloor. (10 hrs.)	Admission & introduction to the trade: Introduction to the Course duration, course content, study of the syllabus. General rule pertaining to the Institute, facilities available– Hostel, Recreation, Medical and Library working hours and time table (07 Hrs)
		4. Demonstrate Safety precautions and First aid. (2 hrs.) 5. Identify the hazards and take personal safety precautions. (3 hrs.) 6. Demonstrate Importance of maintenance and cleanliness ofWorkshop. (5 hrs.) 7. Demonstrate safe handling, safe disposal of used Indian oil and perform periodic testing of lifting equipment. (8 hrs.) 8. Apply energy saving Tips of ITI electricity Usage. (7 hrs.)	Occupational Safety & Health Importance of Safety andgeneral. Precautions to be observed in the shop. Basic first aid, safety signs - for Danger, Warning, caution & personal safety message. Safe handling of Fuel Spillage, Fire extinguishers used for different types of fire. Safe disposal of toxic dust, safe handling and Periodic testing of lifting equipment, Authorization of Moving & road testing vehicles. Energy conservation- Definition, Energy Conservation Opportunities (ECOs)-Minor ECos and Medium ECOs, Major ECOs), Safety disposalof Used engine oil, Electrical safety tips. (07 Hrs)

Professional Skill 100 Hrs; Professional Knowledge 28 Hrs	Plan and Perform precision measurements on the components and compare parameters with specifications used in automotive work shop practices.	9. Use all marking aids, like steel rule with spring calipers, dividers, scriber, punches, Chisel etc. (08 hrs.) 10. Layout a work piece- for line, circle, arcs and circles. (08 hrs.) 11. Measure a wheel base of a vehicle with measuring tape. (08 hrs.) 12. Measure valve spring tension using spring tension tester. (08 hrs.) 13. Remove wheel lug nuts with use of an air impact wrench. (09 hrs.) 14. Use General workshop tools& powertools. (09 hrs.)	Hand & Power Tools:- Marking scheme, Marking material-chalk, Prussian blue. Cleaning tools- Scraper, wire brush, Emery paper, Description, care and use of Surface plates, steel rule, measuring tape, try square. Calipers-inside and outside. Dividers, surface gauges, scriber, punches-prick punch, center punch, pin punch, hollow punch, number and letter punch. Chisel-flat, cross-cut. Hammer- ball pein, lump, mallet. Screw drivers-blade screwdriver, Phillips screw driver, Ratchet screwdriver. Allen key, bench vice & C-clamps, Spanners- ring spanner, open end spanner & the combination spanner, universal adjustable open end spanner. Sockets & accessories, Pliers - Combination pliers, multi grip, long nose, flat-nose, Nippers or pincer pliers, Side cutters, Tin snips, Circlip pliers, external circlips pliers. Airimpact wrench, air ratchet, wrenches- Torque wrenches, pipe wrenches, car jet washers Pipe flaring & cutting tool, pullers-Gear and bearing. (14 Hrs)
		15. Apply Measuring systems on Cam height, Camshaft Journal dia, crankshaft journal dia, Valve stem dia, piston diameter, and piston pin dia with outside Micrometers. (8 hrs.) 16. Measure and record the height of the rotor of an	Systems of measurement, Description, care & use of - Micrometers- Outside and depth mirometer, Micrometer adjustments, Vernier calipers, Telescope gauges, Dial bore gauges, Dial indicators, straightedge, feeler gauge, thread pitch gauge, vacuum

		oil pump from the surface of the housing or any other auto component measurement with depth micrometer. (6 hrs.) 17. Measure valve spring free length, cylinder bore. (3 hrs.) 18. Connecting rod bore, inside diameter (ID) of a camshaft bearing with Telescope gauges. (4 hrs.) 19. Measure cylinder bore for taper and out-of-round with Dial bore gauges. (5 hrs.) 20. Measure wear on crankshaft end play, crankshaft run out, and valve guide with dial indicator. (6 hrs.) 21. Measure the standard parameters to check the flatness of the cylinder head is warped or twisted with straightedge is used with a feeler gauge. (5 hrs.) 22. Measure to check the end gap of a piston ring, piston-to-cylinder wall clearance with feeler gauge. (6 hrs.) 23. Check engine manifold vacuum with vacuum gauge. (4 hrs.) 24. Test the air pressure inside the vehicle tires is maintained atthe recommended setting. (3 hrs.)	gauge, tire pressure gauge. (16 Hrs)
Professional Skill 50 Hrs; Professional	Carryout marking and perform basic fitting operations used in the work	25. Perform general cleaning, checking and use of nut, bolts, & studs etc. (05 hrs.)	Fasteners- Study of different types of screws, nuts, studs & bolts, locking devices, Such as lock nuts, cotter, split pins,

Knowledge 14 Hrs	shop practices along with inspection of dimensions.	26. Remove stud/bolt from blind hole. (05 hrs.) 27. Use cutting tools like Hacksaw, file, chisel, Sharpening of Chisels, center punch, safety precautions while grinding. (08 hrs.) 28. Use Hacksaw and perform filing to given dimensions. (07 hrs.)	keys, circlips, lock rings, lock washers and locating where they are used. Washers & chemical compounds can be used to help secure these fasteners. Function of Gaskets, Selection of materials for gaskets and packing, oil seals. Cutting tools :- Study of different type of cutting tools like Hacksaw, File- Definition, parts of a file,specification, Grade, shape, different type of cut and uses., OFF-hand grinding with sander, bench and pedestal grinders, safety precautions while grinding. Limits, Fits & Tolerances:- Definition of limits, fits & tolerances with examples used in autocomponents. (07 Hrs)
		29. Mark and Drill clear and Blind Holes, Sharp Twist Drills observing Safety precautions while using a drilling machine. (09 hrs.) 30. Tap a Clear and Blind Hole, Select tape drill Size, use Lubrication, stud extractor. (07 hrs.) 31. Cut Threads on a Bolt/ Stud. Adjust two piece Die, ream a hole/ Bush to suit the given pin/ shaft and scrap a givenmachined surface. (09 hrs.)	Drilling machine - Description and study of Bench type Drilling machine, Portable electrical Drilling machine, drill holding devices, Work Holding devices, Drill bits. Taps and Dies: Hand Taps and wrenches, Calculation of Tap drill sizes for metric and inch taps. Different type of Die and Die stock. Screw extractors. Hand Reamers – Different Type of hand reamers, Drill size for reaming, Lapping, Lapping abrasives, type of Laps. (07 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Produce sheet metal components using bending process & other various sheet metal operations.	32. Make Rectangular Tray using Pipe bending process and fit nipples unions in pipes. (15 hrs.) 33. Perform Soldering and Brazing of Pipes. (10 hrs.)	Sheet metal - State the various common metal Sheets used in Sheet Metal shop Sheet metal operations - Shearing, bending, Drawing, Squeezing Sheet metal joints - Hem & Seam Joints Fastening

			Methods - Riveting, soldering, Brazing. fluxes used on common joints. Sheet and wire-gauges. The blow lamp- its uses and pipe fittings. (07 Hrs)
Professional Skill 75 Hrs; Professional Knowledge 21 Hrs	Construct electrical circuits and perform testing of basic electrical parameters by using electrical measuring instruments.	34. Join wires using soldering Iron; construct simple electrical circuits, measure current, voltage and resistance using digital multimeter. (12 hrs.) 35. Perform continuity test for fuses, jumper wires, fusiblelinks, and circuit breakers. (13 hrs.)	Basic electricity, Electricity principles, Ground connections, Ohm's law, Voltage, Current, Resistance, Power, Energy. Voltmeter, ammeter, Ohmmeter Mulitmeter, Conductors & insulators, Wires, Shielding, Length vs. resistance, Resistor ratings. (07 Hrs)
		36. Diagnose series, parallel, series- parallel circuits using Ohm's law. (20 hrs.) 37. Check electrical circuit with a test lamp, perform voltage drop test in circuits using multimeter and measure current flow using multimeter/ammeter. (10 hrs.) 38. Use service manual Wiring diagram for troubleshooting. (20 hrs.)	Fuses & circuit breakers, Ballast resistor, Stripping wire insulation, cable colour codes and sizes, Resistors in Series circuits , Parallel circuits and Series-parallel circuits, Electrostaticeffects, Capacitors and its applications, Capacitors in series and parallel. (14 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Construct basic electronic circuits and testing.	39. Identify and test power and signal connectors for continuity. (7 hrs.) 40. Identify and test different type of Diodes, NPN & PNP Transistors for its functionality. (8 hrs.) 41. Construct and test simple logic circuits OR, AND &NOT and Logic gatesusing switches. (10 hrs.)	Basic electronics: Description of Semi conductors, Solid state devices- Diodes, Transistors, Thyristors, Uni Junction Transistors (UJT), Metal Oxide Field Effect Transistors (MOSFETs), Logic gates-OR, AND & NOT and Logic gates using switches. (07 Hrs)
Professional Skill 50 Hrs;	Manufacture components with different types of	42. Make straight beads and Butt, Lap & T joints Manual Metal Arc	Introduction to welding and Heat Treatment Welding processes – Principles of Arc

Professional Knowledge 14 Hrs	welding processes in the given job.	Welding. (25 hrs.) 43. Set Gas welding flames and practice to make a straight beads and joints Oxy – Acetylene welding, film on Heat treatment process. (25 hrs.)	welding, brief description, classification and applications. Manual Metal Arc welding - principles, power sources, electrodes, welding parameters, edge preparation & fit up and welding techniques; Oxy – Acetylene welding - principles, equipment, weldingparameters, edge preparation & fit up and welding techniques;. Heat Treatment Process– Introduction, Definition of heat treatment, Definition of Annealing, Normalizing, Hardening and tempering. Case hardening, Nitriding, Induction hardening and Flame Hardening process used in autocomponents with examples. (14 Hrs)
Professional Skill 75 Hrs; Professional Knowledge 21 Hrs	Identify and select the hydraulic and pneumatic components in a vehicle and inspect the auto component using Non-destructive testing methods.	44. Perform Liquid penetrant testing method and Magnetic particle testing method. (12 hrs.) 45. Identify hydraulic and pneumatic components used in vehicle. (18 hrs.) 46. Trace hydraulic circuit on hydraulic jack, hydraulic power steering, and Brake circuit. (20 hrs.) 47. Identify components in Air brake systems. (10 hrs.)	Non-destructive Testing Methods- Importance of Non-Destructive Testing In Automotive Industry, Definition of NDT, Liquid penetrant and Magnetic particle testing method – Portable Yoke method Introduction to Hydraulics &Pneumatics: - Definition of Pascal law, pressure, Force, viscosity. Description, symbols and application in automobile of Gear pump-Internal & External, single acting, double acting & Double ended cylinder; Directional control valves-2/2, 3/2, 4/2, 4/3 way valve, Pressure relief valve, Non return valve, Flow control valve used in automobile. Pneumatic Symbols,

			Description and function of air Reciprocating Compressor. Function of Air serviceunit (FRL-Filter, Regulator &Lubricator). (14 Hrs)
		48. Recognize different type of Vehicle and demonstrate vehicle specification data. (7 hrs.) 49. Find and select vehicle information Number (VIN), Garage, Service station equipments. (8 hrs.) 50. Identify vehicle hoists – Two post and four post hoist, Engine hoists, Jacks, Stands. (10 hrs.)	Auto Industry - History, leading manufacturers, development in automobile industry, trends, new product. Brief about Ministry of Road transport & Highways, The Automotive Research Association of India (ARAI), National Automotive Testing andR&D Infrastructure Project (NATRIP), &Automobile Association. Definition: - Classification of vehicles on the basis of load as per central motor vehicle rule, wheels, final drive, and fuel used, axles, position of engine and steering transmission, body and load. Brief description and uses of Vehicle hoists – Two post and four post hoist, Engine hoists, Jacks, Stands. (07 Hrs)
Professional Skill 150 Hrs; Professional Knowledge 42 Hrs	Overhaul Diesel Engine of Tractor.	51. Demonstrate tractor specification data. (5 hrs.) 52. Identify and demonstrate different major assemblies of tractor and cleaning of tractors, oil greasing and lubricating all moving parts of tractor. (18 hrs.) 53. Start and stop tractor engine. (2 hrs.)	Tractor Industry in India - leading manufacturers, development in Tractor industry, trends, new product. Study of tractors, dozers & their major assemblies, and different make (indigenous). Constructional differences between tractor and dozers and their merits. Different type of Tractor starting method and stopping. (07 Hrs)
		54. Dismantle tractor engine as per procedure & Inspection of components	**Engine Basics:** Classification of engines, Principle & working of 2&4-

		for dimension and wear. (25 hrs.)	stroke diesel engine (Compression ignition Engine (C.I), Principle of Spark Ignition Engine(SI), differentiate between 2-stroke and 4 stroke, C.I engine and S.I Engine, Direct injection and Indirect injection. Brief on common rail diesel injection engine. Engine output, compression pressure, Compression ratio. (07 Hrs)
		55. Remove cylinder head from engine and Overhaul cylinder head assembly with use of service manual for clearance and other parameters. (13 hrs.) 56. Remove rocker arm assembly manifolds and demonstrate fitting of valve guide. (12 hrs.)	**Engine Components -** working principle & construction of cylinder heads, types of combustion chambers. Function of Engine Valves, different types, materials, Type of valve operating mechanism. Importance of Valve seats & inserts, importance of Valve movement, Valve stem, oils eals, Valve-timing diagram and concept of Variable valve timing.(07 Hrs)
		57. Overhaul Cylinder block. Measure and record required parameters of cylinder liner & crankshaft for ovality and taperness. (10 hrs.) 58. Overhaul piston and connect rod assembly with use of service manual for clearance and other parameters. (10 hrs.) 59. Removing oil sump and oil pump and clean the sump. (5 hrs.)	**Description of Cylinder block, Cylinder block construction,** types of cylinder blocks & cylinder liners. Description &functions of different types of pistons, piston rings and piston pins and materials. Used recommended clearances for the rings and its necessity precautions while fitting rings, common troubles and remedy. (07 Hrs)
		60. Remove the big end bearing and connect rod with the piston. (4 hrs.) 61. Remove the piston rings,	Description & function of connecting rod, importance of big-end split obliquely, Materials used for connecting rods big end & main bearings.

		dismantle the piston and connecting rod. (4 hrs.) 62. Check the side clearance of piston rings in the piston groove & lands for wear. (3 hrs.) 63. Check piston skirt and crown for damage and scuffing, clean oil holes. (4 hrs.) 64. Measure -the piston ring close gap in the cylinder, clearance between the piston and the liner, clearance between crank pin and the connecting rod big end bearing. (10 hrs.)	Shells piston pins and locking methods of piston pins. Recommended clearances for the cylinder liners & rings. Bearing failure & its causes-care & maintenance. (07 Hrs)
		65. Check connecting rod for bend and twist and set connecting rod big end & main bearing. (7 hrs.) 66. Assemble crank shaft, main bearings, and connecting rods and demonstrate piston assembly in the engine, fitting cylinder head and set valve timing. (18 hrs.)	Description of crankshaft & Camshafts. Types of their drives. Description of Overhead camshaft, importance of Cam lobes. Crankcase ventilation (PCV). Camshaft, Crank-shaft balancing, Firing order of the engine. Description and function of the fly wheel and vibration damper. Timing mark. (07 Hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Service Cooling and Lubrication system of Tractor in a workshop	67. Check cooling system for overheating/ under-cooling. (6 hrs.) 68. Dismantle, clean, assemble& test water pumps, reverse flushing system. (13 hrs.) 69. Check thermostat valve, pressure cap and adjust the fan belt tension. (6 hrs.)	**Cooling systems:-**Purpose, types, Heat transfer method, effect of boiling point & pressure, coolant properties, preparation and recommended change of interval, use of antifreezer. **Cooling system components,** water pump, function of thermostat, pressure cap, Recoverysystem& Thermo-switch. Function & types of Radiator. (07 Hrs)
		70. Identify and select lubrication oil flow circuit	**Lubrication system:** - purposes & characteristics of oil, type of

		inan engine. (10 hrs.) 71. Overhaul oil pump, serviceoil cooler & centrifugal oil filter and test oil pressure. (15 hrs.)	lubricants, grade as per SAE, & their application, oil additives, type of lubrication system. Lubrication system components- different type of Oil pump, Oil filters & oil cooler. Probable reasons for low / high oil pressure, high oil consumption and their remedies. (07 Hrs)
Professional Skill 75 Hrs; Professional Knowledge 21 Hrs	Service Exhaust System and Fuel Feed System of Tractor in a workshop.	72. Service air cleaner (Oil bath). (2 hrs.) 73. Check & change air filter, Dismantle &assemble turbocharger, check for axial clearance as per service manual. (5 hrs.) 74. Check Exhaust Gas Recirculation. (1 hr.) 75. Check Exhaust system for rubber mounting for damage, deterioration and out of position; for leakage, loose connection, dent and damage. (5 hrs.) 76. Perform Exhaust. (2 hrs.) 77. Manifold removal and installation. (5 hrs.) 78. Perform Catalytic converter removal and installation. (5 hrs.)	**Intake & exhaust systems** - Description of Diesel induction & Exhaust systems. Description & function of air compressor, exhauster, Super charger, Intercoolers, turbo charger, variable turbo charger mechanism. **Intake system components-** Description and function of Air cleaners, Different type air cleaner, Description **of** Intake manifolds and material. **Exhaust system components-** Description and function of Exhaust manifold, Exhaust pipe, Mufflers- Reactive, absorptive, Combination, Electronic mufflers, Catalytic converters, Back- pressure, Diesel particulate filter, Exhaust Gas Recirculation (EGR). (07 Hrs)
		79. Repair a tractor carburetors - adjusting float level and slow speed adjustments - studying the fuel flow circuit in carburetor. (7 hrs.) 80. Perform engine tune up in a vehicle - testing vacuum and compression of engine, adjusting tappets setting ignition timing and adjusting carburetor for slow speeds. (8 hrs.)	**Carburetor operation**- Carburation, Carburetor system components, Carburetor systems, Metering jets, Accelerating, Carburetor barrels **Diesel Fuel Systems-** Diesel fuel characteristics, concept of Quiet diesel technology & Clean diesel technology, Fuel feed system used in Tractor's description and layout. Diesel fuel system

		81. Trace different parts of fuel system, repair fuel leaks in pipe line and unions. (5 hrs.) 82. Service and test fuelfeed pump, fuel filters, fuel Injection Pump. (7 hrs.) 83. Service pressure pump of (C.R.D.I.). Regulator's and Elect/Electronic injectors, checking operation of C.R.D.I.system. (7 hrs.) 84. Overhaul & Test of injectors. Set injection timing; Bleeding fuel lines for Air locks. (8 hrs.) 85. Test cylinder compression, Checking idle speed, Obtaining & interpreting scan tool data. Fault finding & remedy, care & Maintenance. (8 hrs.)	components, Description and function of Diesel fuel injection system, types of fuel injection pumps, type of drive, injectors-types and function. Governor and their types. Distributor-typeinjection pump, Glow plugs, Cummins & Detroit Dieselinjection, Diesel electronic control- Diesel electronic control systems (DEC), Common rail diesel injection system. Method of bleeding fuel supply system. (14 Hrs)
Professional Skill 100 Hrs; Professional Knowledge 28 Hrs	Overhaul Clutch, Gearbox, Steering system, differential and PTO unit of Tractor in a workshop.	86. Dismantle and assemble clutch assembly and inspect the parts of clutch, relining of clutch plate & assemble. (6 hrs.) 87. Couple the clutch with flywheel & join the engine with gear box. (6 hrs.) 88. Adjust clutch pedal free play. (3 hrs.) 89. Dismantle gear box of a tractor & inspect the parts. (4 hrs.) 90. Assemble the gear box. Overhaul Transfer case and auxiliary gear box. (6 hrs.)	**Clutch**:-types, construction and function. Components of clutch -driver & driven plates, torsion spring, cushion springs, operating fingers, clutch shaft, Slave cylinder & oil seal. Clutch release bearing &linkages. **Manual transmissions-** Function, description, types and their application. Gearbox layout. Components of tractor gear box. Principle of epicyclical gear box. Necessity of torque convertor, need of 4 x 4 wheel drive / Front wheeldrive, Low & high gear ratio, universal joint and propeller shaft. (07 Hrs)
		91. Overhaul differential; service reduction gear,	**Final Drive & Drive Shafts** Differential carriers double

		rear axle wheel hub. (10 hrs.) 92. Service PTO (Power Take Off) and measure rpm of PTO shaft & speed of belt pulley. (15 hrs.)	reduction gearing, differential lock, crown wheel and pinion adjustments, function and types of power take off (PTO) mechanism. Types of front & rear axles. Common trouble and their remedies, care and maintenance. (07 Hrs)
		93. Check Layout of Mechanical steering system. (5 hrs.) 94. Inspect Steering linkage and necessary repair. (4 hrs.) 95. Remove steering wheel and overhaul steering gear box of tractor. (7 hrs.) 96. Remove front axle and spindle hub and steering linkage. (7 hrs.) 97. Reassembling steering assembly and test for correct function. (6 hrs.) 98. Check and test layout of different parts of Hydraulic steering system. (7 hrs.) 99. Conduct visual Inspection of chassis frame for crack, bent and twists. (5 hrs.) 100. Overhaul and Inspect shackle, front & rear suspension. (9 hrs.)	**Steering & Suspension Systems-** Function and types of steering system.Description, construction and function of mechanical steering system steering wheel, steering gear box, tie-rod, arms link, ball and socket joints etc. their movement and adjustment. Description and mechanism of foot steerage pedal as incorporated in tractors. Description, working and principle of hydraulic steering system. Different parts such as pump, distributor valves, pipe line and hoses etc Development of mechanical framing. Use of Power tiller, Tractor & Bulldozer, Chassis frame oftractor. (14 Hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Carryout Repair of Wheels and Tyres of Tractor in the Workshop.	101. Remove wheels from tractor. (10 hrs.) 102. Dismantle wheel to check rims, tyres for wear and tubes for leaks. (09 hrs.) 103. Repair, derust, paint, fit tyres and tubes on rim & inflate to correct pressure. (10 hrs.) 104. Balance Tractor wheels and perform tyre	**Wheels &Tyres-** Description, construction and function of Wheel. Rim sizes. Types & sizes of tyres. Solid, pneumatic & Radial. Ply rating. Tyre materials, Hysteresis & designations, Tyre information, Tyre tread designs, Tyre ratings for temperature & traction. Importance of in-Flatting tyres to correct pressure. Repair and

		rotation. (8 hrs.) 105. Fit wheels on tractors and tighten wheel in correct sequence. (09 hrs.) 106. Check & adjust tire pressure by use of airor by Nitrogen. (5 hrs.)	maintenance of tyres and tubes. Storage of tyres. Descriptions Tirewear Patterns and causes Nitrogen vs atmospheric air in tyres (14 Hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Overhaul Brake system of Tractor in the workshop.	107. Overhaul brakes including cleaning and inspection of all components, relining shoes, setting and actuating shoe clearance. (10 hrs.) 108. Inspect spring of both shoe and lever. (5 hrs.) 109. Inspect and set parking brakes. Inspect and set hydraulic main brake including replacement of washer and oil seals. (10 hrs.) 110. Overhaul serve mechanism (as applicable) inspecting piston and valves; bleeding and adjustment of brakes. (12 hrs.) 111. Trace faults and apply remedies. (5 hrs.) 112. Skim brake drum and disc plate. (8 hrs.)	**Braking Systems -** Braking fundamentals Principles of braking, Drum & disc brakes, Lever/mechanical advantage, Hydraulic pressure &force, Brake fade. **Braking systems** - Brake type used on tractor - principles, Air brakes, **Braking system components**- Park brake system, Brake pedal, Brake lines, Brake fluid, Bleeding, Master cylinder, Divided systems, Tandem master cylinder, Power booster or brake unit, Hydraulic brake booster, Applying brakes, Brake force, Brake light switch **Drum brakes & components** - Drum brake system, Drum brake operation, Brake linings & shoes, Backing plate, Wheel cylinders **Disc brakes & components** -Disc brake system, Disc brake operation, Disc brake rotors, Disc brake pads, Disc brake calipers, Proportioning valves, Proportioning valve operation, Brake friction materials. (14 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Overhaul Major Assemblies of Power Tiller and carryout Field Operation.	113. Overhaul power tiller transmission system including main clutches, steering clutch/brakes mechanism-gear box.	Description, working principle & use of **power tiller** (two wheel tractor) power unit. Method of power transmission to wheel from engine. Main clutch assembling working

		(18 hrs.) 114. Perform wheel hub testing for field operation without implements and with implements. (7 hrs.) 115. Drive with trolley/trailer.	procedure steering Clutch/brakes mechanism method of power transmission to implement (Rotation), irrigation pump, thresher. Hitching of M.B. Plough, trailerdisc harrow. (07 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Overhaul and troubleshoot for correct functioning of Implements of Tractor.	116. Check implements such as ploughs, harrows, cultivators, seed drills, tractor trailer, & P.T.O. units etc. forserviceabilitybeforeuse.Lubricatethem as required. (5 hrs.) 117. Perform Hitching practice (single &threepoints).Exercisei ndriving a tractor with different implements. (15 hrs.) 118. Adjustagriculture implements for correct functioning during field operation. (5 hrs.)	**Tractor equipment:-** Description, function of harrows, cultivators, seed drills & tractor trailer. Hitching of equipment. Danger in overloading & incorrect field operation. Average life of Agriculture implements. Description and function of tractor accessories such as Draw bar, top link & Belly Pulley. Setting of draw bar to correct height. Use of Hydraulic lift. Maintenance of tractor accessories. (07 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Perform battery testing, charging operations and overhaul charging and Starting System of Tractor.	119. Clean and top up a lead acid battery. (1 hr.) 120. Test battery with hydrometer,connect battery to a charger for battery charging. (1 hr.) 121. Inspect & test a battery after charging. (1 hr.) 122. Measure and Diagnose the cause(s) of excessive Key-off battery drain (parasitic draw) and do corrective action. (4 hrs.) 123. Test relay, solenoids and its circuit. (2 hrs.) 124. Remove alternator from vehicle. (1 hr.) 125. Dismantle, clean and	Description of Chemical effects, Batteries & cells, Lead acid batteries & Stay Maintenance Free (SMF) batteries, Magnetic effects, Heating effects, Thermo-electric energy, Thermisters, Thermo couples, Electrochemical energy, Photo-voltaic energy, Piezo-electric energy, Electromagnetic induction, Relays, Solenoids, Primary & Secondary windings, Transformers, stator and rotor coils. **Tractor Electrical Maintenance:** Lighting arrangement in tractors (As applicable).

		check for defects. (3 hrs.) 126. Assemble and test for motoring action of alternator & fittingto vehicles. (3 hrs.) 127. Remove starter motor vehicle and overhaul and test the starter motor. (6 hrs.) 128. Service storagebatteries, trace lightingcircuit and rectify Fault. (3 hrs.)	Description of charging circuit. Operation of alternator, regulator unit ignition warning lamp troubles and remedy in charging system. Fault finding in electrical system. Description of **starter motor circuit,** common troublesandremedyinstartercircuit.Descriptionof lightingcircuit.Charging&dischargingofleadacid Battery. (06 Hrs)

SYLLABUS – MECHANIC AGRICULTURAL MACHINERY			
Second Year			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Test andrectify faults in functionality of major components and assemblies of Mould Board Plough, Disc Plough and troubleshoot of tillage and its implements.	129. Use of PPE while dismantling and assembling of Mould Board plough. (10 hrs.) 130. Explain range of machinery used in the trade & their features. (8 hrs.) 131. Demonstrate precautions to be observed in handling farm machinery. (7 hrs.)	Introduction to the trade curriculum. Importance of the trade in the advancement of Agriculture technology in the country. (09 Hrs)
		132. Dismantle Mould Board plough. Check, repair & replace their Component. (4 hrs.) 133. Assemble MB plough, measure Horizontal & Vertical suction. (3 hrs.) 134. Dismantle disc plough, check, repair & replace their components. (3 hrs.) 135. Assemble disc plough, measure disc & tilt angle of disc plough. Workshop adjustments. (4 hrs.) 136. Perform Hitching of ploughs. Field operation & adjustments. (6 hrs.) 137. Identify Faults and apply remedies. (2 hrs.) 138. Perform care and maintenance. (3 hrs.)	Types of tillage & their uses. Working principles of ploughs. Constructional details. Workshop adjustments. Method of hitching. Importance of weight transfer. Considerations while using mounted and semi mounted implements. Method of ploughing. Methods of field operation. Recommended speeds for operation under different field conditions. Daily and periodical maintenance (09 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 9 Hrs	Check, test and troubleshoot faults in functionality of major components and assemblies of Chisel Plough and Rotavator.	139. Service sub soiler and dismantle chisel plough.(1 hr.) 140. Check, repair & replace the component.(3 hrs.) 141. Assemble chisel plough. (1 hr.) 142. Hitch sub soiler/ chisel plough. (2 hrs.)	Function & working of sub soiler/ chisel plough. Constructional details. Function & working of Rotavator. Workshop adjustments. Method of hitching. Importance of weight

		143. Dismantle Rotavator, check repair and replace its components. (5 hrs.) 144. Assemble Rotavator and conduct workshop adjustments. (5 hrs.) 145. Perform field operations & adjustments. (3 hrs.) 146. Find Faults and apply remedies. (3 hrs.) 147. Perform Care and maintenance. (2 hrs.)	transfer. Method of ploughing. Method of Field operation. Recommended speeds for operation of rotavators. Daily and periodical maintenance (09 Hrs)
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Troubleshoot &Test the functionality of major components and assemblies of disc harrows (Off set Type/Double action and single action) and Power harrows.	148. Dismantle& assemble disc harrows (Off set Type/Double action). (5 hrs.) 149. Dismantle& assemble disc harrows (Single action). (4 hrs.) 150. Measure gang angle. (1 hr.) 151. Dismantle& assemble bar/power harrows. (1 hr.) 152. Service spring/blade harrow. (2 hrs.) 153. Plan and prepare Hitching arrangements. (1 hr.) 154. Perform field operation &adjustments. (7 hrs.) 155. Detect Faults and apply Remedies. (2 hrs.) 156. Perform Care and maintenance. (2 hrs.)	Types of harrows & their uses. working principles& Constructional details. Setting and adjustments. Hitching and mode of operation. Difference between disc harrows & drag harrow. Difference between disc harrows & disc plough. Trouble shooting. Safety precautions. (18 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 09 Hrs	Check and Service proper functionality of major components and assemblies of cultivators and soil forming equipments.	157. Dismantle the cultivator (Spring /Rigid) and check, repair & replace the components. (6 hrs.) 158. Assemble the cultivator. (1 hr.) 159. Illustrate setting of cultivators with the help of floor diagram. (3 hrs.) 160. Demonstrate Workshop adjustments, and perform field operation & adjustments. (6 hrs.) 161. Trace Faults and implement	Types of cultivator. Working Principles & their constructional details, adjustments. Common types of shovels & seeps. Adjustments, mode of operation. Trouble shooting. Care & Maintenance. (09 Hrs)

		Remedies. (6 hrs.) 162. Perform Care and maintenance.(3 hrs.)	
Professional Skill 25 Hrs; Professional Knowledge 09Hrs	Identify and check functionality of major components and assemblies of Lazar leveler, trencher & post hole digger.	163. Dismantle and assemble levelers, scrapers/ blade terracer, ditchers and bund formers/dozer/dumper. (5 hrs.) 164. ServiceLazar leveler, post hole digger. (5 hrs.) 165. Dismantle, check, repair & replace the components of Lazar leveler, trencher & post hole digger. (5 hrs.) 166. Assemble Lazar leveler, trencher & post hole digger. (4 hrs.) 167. Arrange and perform Workshop adjustments. (3 hrs.) 168. Setadjust and troubleshoot field operation. (3 hrs.)	Soil forming equipment & their types. Constructional details of levelers, scrapers/ blade terracer, ditchers and bund formers. Constructional details of Lazar leveler, trencher & dozer/dumper and post hole digger. Prime mover & driving practice. Adjustments, mode of operation. Method of Field operation. Recommended speeds for operation. Daily and periodical maintenance, Care &Maintenance. (09 Hrs)
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Dismantle, assemble and troubleshoot seed drills.	169. Dismantle& assemble seed drills. (5 hrs.) 170. Calibrate seed & fertilizer rates. (5 hrs.) 171. Perform Workshop adjustments of special drills such as zero till, strip drill/rotto drill & Happy seeder. (18 hrs.) 172. Conduct Field operation & adjustments of special drills such as zero till, strip drill/rotto drill & Happy seeder. (18 hrs.) 173. Trace Faults and apply remedies. (4 hrs.)	Types of seed drills & their uses. Constructional details of seed cum fertilizer drill. Seed & fertilizer metering devices. Constructional details of special drills such as zero till, strip drill/rotto drill & Happy seeder. Types of furrow openers, methods of transmission of power. Calibration & workshop adjustments. Field calibration and mode of operation. Guide chart for mixing fertilizers. Recommended speeds foroperation. Care & maintenance. (18 Hrs)
Professional	Test and verify functions of major	174. Dismantle& assemble of planters, calibrate seed	Types of planters. Constructional details of

Skill 100 Hrs; Professional Knowledge 36 Hrs	components and assemblies of planters and fertilizer applicators.	&fertilizer rates. (10 hrs.) 175. Conduct Workshop adjustments and set planter with different seed plates & adjusts for planting. (12 hrs.) 176. Repair furrow openers. (5 hrs.) 177. Servicing of veg. transplanter. (5 hrs.) 178. Use veg. transplanter and adjustments. (5 hrs.) 179. Service paddy transplanter and raise type of MAT type nursery for paddy. (5 hrs.) 180. Use paddy transplanter. Raise bed and adjustments. (4 hrs.) 181. Use cage-wheels and paddy Puddles. (4 hrs.)	Maize, Cotton, G/ nut & potato planters. Constructional details of paddy transplanter, Sugarcane & paddy transplanter. Common metering devices. Types of furrow openers. Power transmission. Function of row marker. Field operation of paddy transplanter. Field operation of veg. transplanter. Use of cage wheels and puddles. (18 Hrs)
		182. Dismantle and assemble fertilizer applicators. (18 hrs.) 183. Perform minor repairs of fertilizer applicator; calibrate fertilizer applicator. (7 hrs.) 184. Perform field operation & adjustments of fertilizer applicators and troubleshoot the problems. (18 hrs.) 185. Follow precautions to be observed in handling fertilizer. (7 hrs.)	Types of fertilizer applicators. Constructional details of fertilizer applicators Types of furrow openers, Methods of transmission of power. Calibration & workshop adjustments. Field operation & adjustments of fertilizer applicators. Recommended speeds foroperation Care & maintenance. (18 Hrs)
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Identify and check functionality of major components and assemblies of volute type centrifugal pump and submersible pump.	186. Visit to a tube well boring sites for study of boring and its operation. (8 hrs.) 187. Dismantle and assemble a volute type centrifugal pump. (4 hrs.) 188. Prepare foundationsand install a pumping set. (8 hrs.) 189. Check Adjustments and operation of a pumping set. (5 hrs.)	Source of water. Study common irrigation and drainage systems. Types of irrigation systems. Types of pumps. Working principles & constructional details of centrifugal pumps. (09 Hrs)
		190. Service a submersible pump. (10 hrs.)	Types of centrifugal pumps constructional

		191. Measure discharge of water and install HDPE, QRC, PVC & dipper pipe line. (15 hrs.)	details & principle of operation of a submersible pump. Description of tools and equipment required for boring a tube well. Use a compressor for revitalizing the tube well to improve its discharge. (09 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 09 Hrs	Service irrigation valves and hydrants.	192. Repair and adjust irrigation valves and hydrants. (5 hrs.) 193. Install sprinkler and fogger. (5 hrs.) 194. Install pop-up and drippers. (3 hrs.) 195. Install drippers on level/ hilly ground. (3 hrs.) 196. Field operation & adjustment (angular/ full circle). Faults and remedies. Troubles and remedies. (9 hrs.)	Pump selection, common prime movers, and coupling devices. Different types of irrigation pipes. Working principles of valves and hydrants. Working principles of Popup/sprinkler & mister /fogger. Working principles of drippers. Methods of field operation & adjustment. Daily and periodical maintenance. Precautions to be observed. Care & Maintenance. (09 Hrs)
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Service and Trouble shoot power tillers/power weeder.	197. ServicePower tiller/power weeder. (6 hrs.) 198. Perform field operation with different attachments with Common adjustments. (10 hrs.) 199. Dismantle and assemble a cultivator and performrepairing andmaintenance. (8 hrs.) 200. Adjust the cultivator with the help of floor diagram. (3 hrs.) 201. Set shovels and sweeps. (1 hr.) 202. Perform field operation of cultivator with shovels and	Types of power tillers, their uses, constructional details. Method of power transmission for different field operation with different attachments. Common types of weeds and their control. Methods of weed control. Constructional detail of power weeder. Premergence and post emergence applications. Recommended weedicides for different crops. Equipments used

		sweeps. (10 hrs.) 203. Troubleshoot faults and apply remedies. (6 hrs.) 204. Plan and prepare care and maintenance work. (6 hrs.)	for their applications. Trouble shooting and remedies. Daily and periodical maintenance. Precautions in handling weedicides. (18 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 09 Hrs	Identify and check functionality of grain handling seed treating and drying and troubleshoot major components and assemblies of AC motors.	205. Familiarize to the trade curriculum. (13 hrs.) 206. Explain importance of the trade in the advancement of Electrical technology in the country. (12 hrs.)	Introduction to the trade curriculum. Importance of safety precaution to be observed in the section. Range of machinery used in the trade & their features. Precautions to be observed in handling farm machinery. (09 Hrs)
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Identify and troubleshoot faults in major components and assemblies of sprayers & dusters.	207. Dismantle and assemble AC motors and identify their parts. (3 hrs.) 208. Demonstrate motor starting devices and its periodical maintenance. (4 hrs.) 209. Detect faults and apply remedies. (4 hrs.) 210. Dismantle and assemble common sprayers. (4 hrs.) 211. Calibrate sprayers and carryout field adjustments & operation of sprayers. (4 hrs.) 212. Dismantle and assemble common dusters. (3 hrs.) 213. Service fogging machine and Calibrate common dusters. (4 hrs.) 214. Carryout field adjustments & operation of duster. (3 hrs.) 215. Service high clearance/cotton sprayers. (3 hrs.) 216. Service Aero blast sprayers. Calibrate & adjust high clearance/ cotton sprayers &Aero blast sprayers. (4 hrs.) 217. Carryout repairs and maintenance work. (4 hrs.) 218. Perform field operation & adjustments. (4 hrs.)	Types of electrical motors used on the farm, their constructional details, selection, operation, care and maintenance. Different types of starters. Fuses and their capacities. Installation of motors. Safety precautions Types of sprayers & dusters. Working principles. Calibrations of sprayers & dusters. Method of operation. Common prime movers. Workshop adjustments. Constructional details, working principles & calibration of high clearance sprayers/ cotton & Aero blast sprayers. Methods of operation. Field operation. Common accidents and their prevention. Care and maintenance. (18 Hrs)

		219. Troubleshootfaults and apply remedies. (4 hrs.) 220. Apply precaution measure while handling insecticides andpesticides. (2 hrs.)	
Professional Skill 25 Hrs; Professional Knowledge 09 Hrs	Detect and troubleshoot major components and assemblies of reaper, reaper winder, straw-reapers.	221. Dismantle and assemble a reaper. (4 hrs.) 222. Carryout Workshop adjustments. (3 hrs.) 223. Dismantle and assemblereaper winder and demonstrate workshop adjustments. (5 hrs.) 224. Dismantle and assemble straw-reapers and carryout their workshop adjustments. (4 hrs.) 225. Carryout hitching and fitting with prime mover. (3 hrs.) 226. Perform field operation& adjustment of reapers/ reaper winder/ straw - reapers. (8 hrs.) 227. Trace faults and ensure correct functioning. (3 hrs.)	Reapers & their types Functions, working principles, constructional details. Field adjustments & operation Care and maintenance. Trouble shooting. Precautions in working & transporting. (09 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 09 Hrs	Troubleshoot the faults in functionality of major components and assemblies of Thresher, Maize seller, Groundnut decorticator.	228. Dismantle and assemble thresher. (4 hrs.) 229. Carryout workshop adjustments. Fit with prime mover. (3 hrs.) 230. Select toolsand use for adjusting and operating in field. (2 hrs.) 231. Dismantle and assembleMaize seller. (4 hrs.) 232. Dismantle and assemblegroundnut decorticator; fit with prime mover. (4 hrs.) 233. Measure important speeds affecting the performance. (1 hr.) 234. Detect fault and apply remedies. (2 hrs.) 235. Demonstrate precautionary	Types of threshers, maize Sheller and ground nut decorticators. Working principles, constructional details. Adjustments and operations. Primemoverand driving systems. Trouble shootingand remedies. Transmission of power belts and pulleys. Safety precautions. (09 Hrs)

		measures forsafe operation.(5 hrs.)	
Professional Skill 75 Hrs; Professional Knowledge 27 Hrs	Identify and check functionality of major components and assemblies of combine harvester-cutter bar assembly, feeder unit, threshing unit, separating unit.	236. Perform on different components systems of combine harvester. (5 hrs.) 237. Describe drive mechanism and controls of combine harvester. (5 hrs.) 238. Drive combine harvester. (5 hrs.) 239. Dismantle cutter bar assembly. Dismantle feeder unit. (2 hrs.) 240. Dismantle threshing unit /separating unit. (2 hrs.) 241. Check, repair and replace the defective components. (6 hrs.) 242. Assemble the components of different systems of combine harvester. (8 hrs.) 243. Carryout workshop adjustments. (4) 244. Transport practice of the combine. (8 hrs.) 245. Operate the combine in the field and adjust according to the field and crop conditions. (8 hrs.) 246. Carryout its servicing and maintenance work. (6 hrs.) 247. Compute grain losses. Storage during off season and perform care and maintenance work. (6 hrs.)	Purpose of a combine harvester. Advantages and limitations. Types of combine harvester. Special purposecombine harvesters. Working principles & constructional of different systems of combine harvester. Components of different systems of combine harvester. Flow path material of combine harvesters. Power transmission & drive systems. Workshop adjustments. Methods of field operation. Field adjustments according to crop & soil condition. Types of grain losses, their causes and remedies. Factors affecting the performance of a combine. Recommended speeds. Considerations while selecting a combine. Custom hiring of combine. Calculating of combine operation of combine harvesting. Safety precautions. (27 Hrs)
Professional Skill 75Hrs; Professional Knowledge 27Hrs	Test and troubleshoot functionality of major components and assemblies of mower, folder harvester, power	248. Dismantle and assemble mower / fodder harvester. (12 hrs.) 249. Demonstrate dismantling and assembling of power chaff/ silage-cutter. (12 hrs.) 250. Perform Workshop	Need of green harvesting equipment. Working principles, constructional details of mover. Functions, working principles, constructional details of folder harvester.

	chaff/silage cutter.	adjustments. (14 hrs.) 251. Perform hitching and fitting with prime-mover. (13 hrs.) 252. Carryout field operation and adjustments. (12 hrs.) 253. Perform servicing and maintenance. (12 hrs.	Functions, working principles, constructional details power chaff/ silage- cutter. workshop and field adjustments. Methods of field operation. care and maintenance. Trouble shooting. Precautions in working & transporting. (27 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 09 Hrs	Detect and rectify functionality of major components and assemblies of rotary harvester, haybailer.	254. Dismantle and assemble rotary harvester/ hay bailer. (2 hrs.) 255. Carryout Workshop adjustments. (3 hrs.) 256. Perform Hitching and fitting with prime- mover. (3 hrs.) 257. Perform field operation andadjustments. (8 hrs.) 258. Use Safety precautions while servicing and maintenance. (2 hrs.) 259. Troubleshoot Faults and apply remdies for proper functioning. (7 hrs.)	Function and working of rotary harvester. Function and working of hay-bailer. Workshop adjustments. Method of field operation. Method of transportation. Common accidents and their prevention. Trouble shooting. Care and maintenance. (09 Hrs)
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Find and troubleshoot faults in major components and assemblies of groundnut digger, potato / oniondigger	260. Dismantlegroundnut digger /potato / onion digger. (08 hrs.) 261. Check, repair and replace the defective components. (08hrs.) 262. Assemble groundnut digger potato /onion digger. (07 hrs.) 263. Carryout Workshop adjustments. Attachment of diggers with prime- movers. (07 hrs.) 264. Perform field operation and adjustments, servicing and maintenance work. (13 hrs.) 265. Identify and troubleshoot faults following safety precautionsand apply	Need & importance of root harvesting machine. Types & working of diggers. Components of diggers. Prime mover attachments and driving system. Transporting the root harvesting machinery. Settings & Adjustments. Troubles & Maintenance. Safety precautions. (18 Hrs)

		remedies for proper functioning. (08 hrs.)	
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Serviceand troubleshoot winnower, cleaner &grader.	266. Service andadjustthe winnower, cleaner &graders. (10 hrs.) 267. Fitwithprimemoverattachment. (10 hrs.) 268. Operate winnower, cleaner and grader. (20 hrs.) 269. Trace Common troubles and its causes. (10 hrs.)	Important of winnowing. Types of winnower and its parts. Importance of cleaning & grading. Types of cleaner/ grader. Methods of cleaning/grading. Prime mover attachments and driving system. Settings and Adjustments. Troubles & maintenance. Safety precautions. (18 Hrs)
Professional Skill 50Hrs; Professional Knowledge 18 Hrs	Maintain and service rice huller, polisher, feed grinder-cum-mixer, hammermill.	270. Service and adjust the rice huller, polisher, the feed grinder-cum- mixer. (15 hrs.) 271. Service and adjust the hammer mill and fit with prime mover. (10 hrs.) 272. Operate rice huller, polisher, hammer mill. (15 hrs.) 273. Trace Common troubles and its causes. (10 hrs.)	Importance of rice huller and polisher, feed grinder-cum-mixer, hammer mill, oil extractor and sugarcane crusher. Constructional details, materials used. Principles of operation. Common faults and remedies. Care & maintenance. Safety precautions. (18 Hrs)
Professional Skill 100Hrs; Professional Knowledge 36 Hrs	Detect and rectify functionality of grain handling seed treating and drying equipment.	274. Visit to a grain drying and storing plant and studydifferent aspects of the construction, adjustments, controls. (15 hrs.) 275. Operate grain handling seed treating and drying equipment. (25 hrs.) 276. Explain silo structure. (10 hrs.)	Working of fans and blowers. Purpose of grain auger, bucket elevator etc., Constructional details and working of a grain drier. Grain storage structure i.e. concrete and sheet metal bins (sylo structure). Methods and instruments used for measuring moisture contents of grains. Equipment and methods used for treatingand fumigating seeds and grains. (18 Hrs)

		277. Prepare Log books. (5 hrs.) 278. Maintain necessary records i.e. Log books of tractors, combines etc. (10 hrs.) 279. Plan and prepare service schedules,off season storage of farm equipment. (15 hrs.)	Operation of transporting and handling equipment i.e. Tractor, tractor trailer, power tiller & combine harvester. (09 Hrs)
		280. Visit to a Government Farms, Haryallee and Co-operative Societies. (6 hrs.) 281. Describe farm records, accounts and log books. (8 hrs.) 282. Plan and prepare service schedule of farm machinery, off season storing of farm equipment. (6 hrs.) 283. Plan and prepare layout and list of equipment of a typical farm workshop. (5 hrs.)	Procedure and principle for efficient management and organization of a farm. Discussion on different farm shop layout. (09 Hrs)