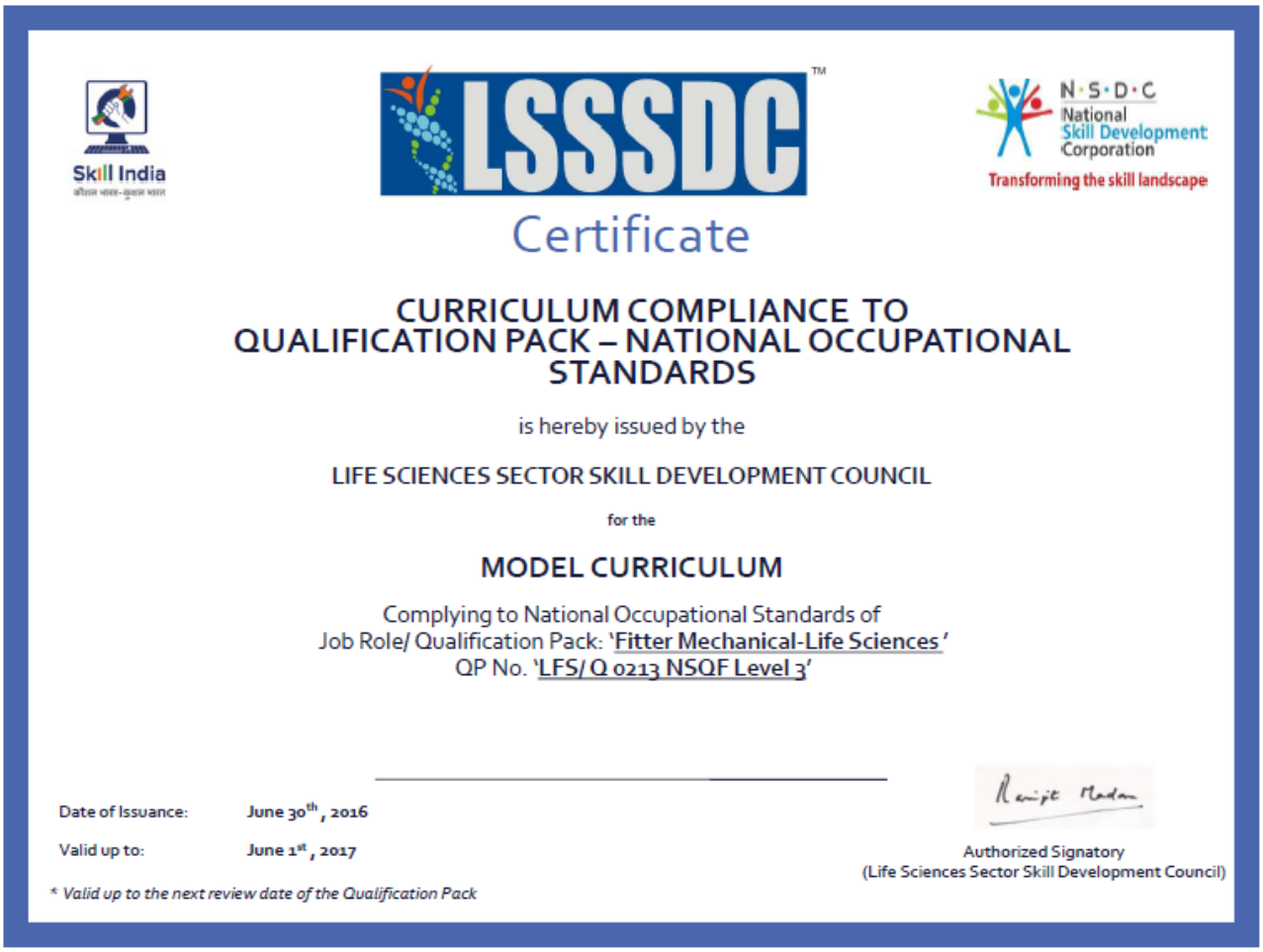
Model Curriculum

Fitter Mechanical – Life Sciences

SECTOR	:	LIFE SCIENCES
SUB-SECTOR	:	PHARMACEUTICAL AND BIOPHARMACEUTICAL
OCCUPATION	:	MANUFACTURING
REF ID	:	LFS/Q 0213, Ver1.0
NSQF LEVEL	:	3



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

LIFE SCIENCES SECTOR SKILL DEVELOPMENT COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: 'Fitter Mechanical-Life Sciences'
QP No. 'LFS/Q 0213 NSQF Level 3'

Date of Issuance: June 30th, 2016

Valid up to: June 1st, 2017

* *Valid up to the next review date of the Qualification Pack*

Authorized Signatory
(Life Sciences Sector Skill Development Council)

TABLE OF CONTENTS

Fitter Mechanical – Life Sciences

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Fitter Mechanical – Life Sciences", in the "Life Sciences" Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	**Fitter Mechanical – Life Sciences**		
Qualification Pack Name & Reference ID.	Fitter Mechanical – Life Sciences LFS/ Q 0213 Ver1.0		
Version No.	1.0	**Version Update Date**	28 – 12 – 2015
Pre-requisites to Training	Minimum qualification – 10+2 / ITI		
Training Outcomes	**After completing this programme, participants will be able to:** • Gain Knowledge about Life Science and Pharmaceutical Industry, values and ethics & cultural practices to enable him/herself for establishing the Industry Standards in his/her performance. • Understand Fitter Mechanical / helper job description and responsibilities. • Support supervisors in the mechanical job work of maintenance process in carrying out maintenance activities for various utilities and production equipments. • Assemble and install infrastructure properly by getting knowledge of its specifications like slings, ropes, cables, pipes, hoses or bundles. • Carry out the basic mechanical fitting and maintenance functions by selecting correct equipment's, materials, processes and procedures, also become familiar with instructions and manuals. • Ensure the smooth operation of the mechanical fitting and maintenance activities and follow maintenance schedules. • Gain and apply the complete knowledge of company's standard operating procedure and guidelines and carry out proper reporting and documentation, types of documentation and recording of data/problem/incidents in secure manner. • Maintain a healthy, safe and secure working environment in the life sciences facility by learning managing emergency situations and their results. • Practice Professional skills at work like decision making, planning & organizing, customer centricity, problem solving, analytical thinking, and critical thinking.		

This course encompasses Four (4) out of Four (4) National Occupational Standards (NOS) of "Fitter Mechanical – Life Sciences LFS/ Q 0215 Ver1.0" Qualification Pack issued by "Life Sciences Sector Skill Development Council".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	**Orientation** **Theory Duration**	• Know and follow General Discipline of the class room • Gain overview about Life Sciences Industry in	GMP Guideline Book, White Board, White Board Duster, White Board Marker, White

	(hh:mm) 10:00 **Practical Duration** (hh:mm) 00:00 **Corresponding NOS Code** Bridge Module	Indian and Global Context • Know the pharmaceutical & biopharmaceutical sub-sector of Life Sciences Industry and manufacturing and maintenance basics and requirements • Gain Orientation with Existing Organisation in Life Sciences Industry (in context of Large/Medium/ Small Enterprises): Their Organization Structure and Benefits. • Know about typical mechanical maintenance activities of a manufacturing function in a Life Sciences organization. • Understand the Role of a Fitter Mechanical and required skills and knowledge (As per Qualification Pack) and its Career Path and information pertaining to employment terms, entitlements • Gain knowledge of legislation, standards (GMP, GLP, GDP), policies, regulations and procedures followed in the life sciences organization relevant to Fitter Mechanical employment and performance conditions • Gain knowledge of relevant health and safety requirements applicable in the work place • Gain knowledge of importance of working in clean and safe environment in life sciences Industry	Screen, Flip Charts, Laser Pointer, Permanent Markers, MS Office, Projector, Sound System With Mike
2	**Perform Fitting and Assembly operations on Metal Components** **Theory Duration** (hh:mm) 24:00 **Practical Duration** (hh:mm) 30:00 **Corresponding NOS Code** LFS/N0260	• Perform basic steps of measurement, mathematical calculations and understand engineering terminology • Extract and use information from engineering drawings and related specifications in relation to work undertaken • Interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing (Geometric Dimensioning and Tolerancing -- GD&T) • Use the basic Marking Devices and prepare suitable datum using basic marking devices • Make selection and establishment of a suitable datum with understanding importance of ensuring that marking out is undertaken from the selected datum • Be aware of possible effects of working from an incorrect datum • Follow mark-out conventions when marking out the workpiece • Calibrate the basic marking devices • Use tools for proper assembly of infrastructure by adjusting their parts in proper order for installation • Follow standard steps while performing different fitting operations • Seek and understand the requirement of assembly or maintenance of manufacturing parts and processing in life sciences sector • Prepare materials in readiness for the marking	ABC Type Fire Extinguisher, Assembling Operations Tools: Bolts, Assembling Operations Tools: Cap Screws, Assembling Operations Tools: External Circlips, Assembling Operations Tools: Internal Circlips, Assembling Operations Tools: Nuts, Assembling Operations Tools: Nuts, Bolts, Machine Screws, Cap Screws ; External Circlips, Internal Circlips, Special Clips;Tab Washers, Locking Nuts, Wire Locks, Shimming And Packing, Assembling Operations Tools:Foiler, Assembling Operations Tools:Hammer, Assembling Operations Tools:Locking Nuts, Assembling Operations Tools:Machine Screws, Assembling Operations Tools:Plier, Assembling Operations Tools:Shimming And Packing, Assembling Operations Tools:Special Clips, Assembling Operations Tools:Tab Washers, Assembling Operations Tools:Wire Locks, Chemical Absorbent Roll, Conventional Lathe Machine, Conventional Milling Machine, Drilling

		out activities, in order to enhance clarity, accuracy and safety • Understand various fitting activities like file flat, square an curved surfaces to achieve smooth surface finish; selection and setting of saw blades, use of hand dies to produce threads; tightening with torque wrenches; determine drill size etc. • Understand methods of holding the workpiece for hand fitting, drilling, threading activities • Understand methods of mounting the workpiece like by pressure, expansion or contraction, securing components using threaded fasteners, securing components using spring clips, securing components using rivets, applying sealing compounds, electrical bonding and torque setting of nuts etc. • Understand methods of aligning, adjusting and positioning components before securing them. • Understand application of cutting fluids and compounds with regards to range of different materials like carbon steel, stainless steel, cast iron, tool steel, hard metals, bronze, aluminum, copper and copper alloys. • Understand use of the work piece and measuring equipment like external micrometers, Vernier/digital/dial calipers, surface finish equipment, rules, squares, protractors, depth micrometers, DTI, CMM etc. • Determine job requirements like raw material (type, quality, quantity) dimensions, limits and tolerances, surface texture, shape or profiles to be fabricated, cutting, bending and rolling allowance, instruments and tools, interdependencies, timelines and sequence of operations from detailed drawings, approved sketches, national and international standards, reference tables / charts etc. • Determine and obtain appropriate equipment, parts and accessories like rollers and skates, crowbars, pull-lifts, lubricated plates, assembly structure (framework, support, casing, panels), pre-machined components, shafts, levers, springs, chains, keys, belts, bearings, couplings gaskets, seals, sprockets etc for general machining and fitting or assembling operations. • Obtain and use calibrated measuring equipment like external micrometers, Vernier/digital/dial caliper, surface finish equipment, rules, squares, protractors, depth micrometers, depth Vernier, feeler gauges, harness tester, dial test indicators (DTI), surface roughness tester, coordinate measuring machine (CMM) etc. • Mark out range of features like datum lines, cutting lines, squares and rectangles, circular and radial profiles, angles, holes, linearly positioned and boxed on pitch circles etc on the components using suitable marking medium, datum and appropriate marking methods like	Machine: Pedestal Drilling Machine, Drilling Machine: Portable, Eye Washer With Sprinkler, Face Mask (Full Face), Face Mask (Half Face), Flexible Shaft Grinding Machine, Flexible Shaft Grinding Machine, Forklift, Generator, Geometric Dimensioning Tool, Gloves({Heat, Acid, Chemical} Resitant), Gloves(Nitrile), Grinding Machine: Ag4 Grinder, Gum Boots, Helmet, Lab Coat, Manual Bottle Eye Washer, Marking Equipments: Permanent Markers, Marking Equipments: Protractor, Marking Equipments: Punches, Marking Equipments: Scribers, Marking Equipments: Scribers, Punches, Scribing Blocks, Squares, Protractor, Marking Equipments: Scribing Blocks, Marking Equipments: Squares, Material Safety Data Sheet, Measuring Equipments : External Micrometers, Measuring Equipments : Vernier/Digital/Dial Caliper, Pvc Apron, Safety Goggles, Safety Shoes, Sample Job Card, Sample Log Books, Sample Machine Histrory Record, Sample Machine Inspection Record, Sample Maintenance Schedule, Sample Shift Schedule, Self Contained Breathing Apparatus, Surface Finish Equipment ;Bore Gauges, Surface Finish Equipment ;Depth Micrometers, Surface Finish Equipment ;Depth Verniers, Surface Finish Equipment ;Feeler Gauges, Surface Finish Equipment ;Height Gauge, Surface Finish Equipment ;Hole Gauges, Surface Finish Equipment ;Profile Gauges, Surface Finish Equipment ;Protractors, Surface Finish Equipment ;Radius Gauges, Surface Finish Equipment ;Rules, Surface Finish Equipment ;Slip Gauges, Surface Finish Equipment ;Thread Gauges, Surface Finish Equipment ;Try Squares, Tolerancing Tool, Trolly, Various Mask Cartridges, Vice Mounted Tables, Computer, Computer

		directing marking using instruments/ templates or traces /transfer method using range of marking tools like rules, tapes, dividers, scribers, punches, scribing blocks, squares, protractors, permanent markers etc. • Cut and shape material to required specifications using hand fitting methods like cutting out rough profile using saws (hacksaw, band saw) cutting a screw thread (tapping or dieing) filing (flat, square, curved) drilling holes, reaming of holes, scrabbling of parts using manually operated machines like manual grinding machines (Ag4, wolf grinding machine etc) drills (power drills, pedestal drills), punching machines, threading machines etc • Assemble and secure the components and sub-assemblies in their correct positions using methods like assembling components with interface fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts. • Fasten components permanently using engineering fasteners, adhesives, soldering and brazing. • Produce components which are free from false cuts, burrs and sharp edges; dimensional tolerances +/-0.20mm, flatness and squareness of 0.05mm, angles within +/-1 degree, screw threads to fit as per standards; reamed and bored holes within interference - 0.025mm (hole) + 0.025mm shaft, transition - 0.1mm (hole)+0.1 (shaft) clearance 50 microns, radius 0.5r, surface finish 63µm or 1.6µm • Dismantle mechanical assemblies without damaging components or sub-assemblies using procedures for isolation and locking off a device / system. • Check dimensional accuracy by measuring linear dimensions (length, depth), diameters (external and internal), flatness, squareness, angles, profiles, hole size and position, thread size and fit.	Workdesk, GMP Guideline Book, White Board, White Board Duster, White Board Marker, White Screen, Flip Charts, Laser Pointer, Permanent Markers, MS Office, Projector, Sound System With Mike
3	**Perform maintenance activities on mechanical equipment/**	• Know the safety procedures and protocols for use of equipment • Follow the health and safety, environmental and other relevant regulations and guidelines at work • Adhere to procedures and guidelines for	ABC Type Fire Extinguisher, Assembling Operations Tools: Bolts, Assembling Operations Tools: Cap Screws, Assembling Operations Tools: External

	machinery **Theory Duration** (hh:mm) 20:00 **Practical Duration** (hh:mm) 30:00 **Corresponding NOS Code** LFS/N0261	personal protective equipment (PPE) and other relevant safety regulations while performing mechanical fitting and maintenance operations • Keep work area clean and safe from following hazards: **Hazards:** use of power tools, trailing leads or hoses, damaged or badly maintained tools and equipment; using files with damaged or poor fitting handles; using machine tools; handling of oils and grease; misuses of tools; not following laid-down maintenance procedures • Follow procedures to keep all tools, equipment, power tool cables, extension leads are in a safe and usable condition • To prepare machine for maintenance operation, get the job requirements such as raw materials or components required (type, quality, quantity); dimensions; limits and tolerances; surface texture requirements; operations required (list, sequence and procedures where applicable); shape or profiles to be fabricated; cutting, bending and rolling allowances for fabricated forms; instruments and tools to be used; interdependencies; timelines • Read and interpret the job specification documents like detailed component drawings; approved sketches/illustrations; national, international and organisational standards; reference tables and charts; fabrication/casting drawings • Secure the instructions only from job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; operation sheets; process specifications; instructions from supervisor • Perform fault diagnosis using the tools like, allen key, spanner, torque wrench, pliers, bearing puller, circlip plier, scraper(flat & triangular), etc and equipments like manufacturer's manual, physical layout diagrams, algorithms, flow charts, probability charts/reports, fault analysis charts (eg. Fault trees), equipment self-diagnostics, troubleshooting guides, machine assembly layout • Use diagnostic techniques like half-split technique; emergent sequence; unit substitution; input/output; function/performance testing; six point technique; injection and sampling; equipment self-diagnostics • Carryout test procedures like alignment checks, force/pressure checks (eg. spring pressure, hydraulic or pneumatic pressures), leakage, vibration, thermal checks (eg. bearings, friction surfaces), movement checks (eg. travel, clearance, levers, links), visual checks • Use testing equipment like measuring instruments/ devices, thermal indicators, dial test indicators, audio test devices, torque measuring devices, self-diagnostic equipment,	Circlips, Assembling Operations Tools: Internal Circlips, Assembling Operations Tools: Nuts, Assembling Operations Tools: Nuts, Bolts, Machine Screws, Cap Screws ; External Circlips, Internal Circlips, Special Clips;Tab Washers, Locking Nuts, Wire Locks, Shimming And Packing, Assembling Operations Tools:Foiler, Assembling Operations Tools:Hammer, Assembling Operations Tools:Locking Nuts, Assembling Operations Tools:Machine Screws, Assembling Operations Tools:Plier, Assembling Operations Tools:Shimming And Packing, Assembling Operations Tools:Special Clips, Assembling Operations Tools:Tab Washers, Assembling Operations Tools:Wire Locks, Chemical Absorbent Roll, Conventional Lathe Machine, Conventional Milling Machine, Drilling Machine: Pedestal Drilling Machine, Drilling Machine: Portable, Eye Washer With Sprinkler, Face Mask (Full Face), Face Mask (Half Face), Flexible Shaft Grinding Machine, Flexible Shaft Grinding Machine, Forklift, Generator, Geometric Dimensioning Tool, Gloves({Heat, Acid, Chemical} Resitant), Gloves(Nitrile), Grinding Machine: Ag4 Grinder, Gum Boots, Helmet, Lab Coat, Manual Bottle Eye Washer, Marking Equipments: Permanent Markers, Marking Equipments: Protractor, Marking Equipments: Punches, Marking Equipments: Scribers, Marking Equipments: Scribers, Punches, Scribing Blocks, Squares, Protractor, Marking Equipments: Scribing Blocks, Marking Equipments: Squares, Material Safety Data Sheet, Measuring Equipments : External Micrometers, Measuring Equipments : Vernier/Digital/Dial Caliper, Pvc Apron, Safety Goggles, Safety Shoes, Sample Job Card, Sample Log Books, Sample Machine Histrory

		other specific test equipment • Carryout Fault diagnostic analysis and risk analysis of fault and complete documentation as per SOP Carryout maintenance activities on gearboxes; machine tool; lifting and handling equipment; processing plant; production plant; engines; pumps; process control valves; compressors; transfer equipment; mechanical structures; work-holding devices(bench vice; machine vice; clamps (eg. toolmaker's); three-jaw chuck; four-jaw chuck; collet chuck; drive plate and centres; jigs and fixtures) • Perform dismantling processes like release of pressures/force, proof marking of components, removal of components by extraction or pressing, etc. • Reassemble the components using methods like assembling components having interference fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts; sby welding • Perform following maintenance techniques: installing, dismantling and reinstalling equipment to unit/sub-assembly level; installing, dismantling and reinstalling units to component level; proof marking/labelling of components; checking components for serviceability; replacing all lifed items (eg. seals, bearings, gaskets); replacing damaged/defective components; setting, aligning and adjusting replaced components; tightening fastenings to the required torque; making 'off-load' checks before starting up; replenishing oils and greases; safety system checks; functionally testing the completed system; check levelling • Perform replacement or refitting of basic hydraulic and pneumatic components like valves; seals; buckets; solenoid operated cylinders; clamping and positioning components; other basic components • Post maintenance activity perform trial run to conform the job specification • Record the observation and entire maintenance activity in the formats defined as per GMP and GDP rules	Record, Sample Machine Inspection Record, Sample Maintenance Schedule, Sample Shift Schedule, Self Contained Breathing Apparatus, Surface Finish Equipment ;Bore Gauges, Surface Finish Equipment ;Depth Micrometers, Surface Finish Equipment ;Depth Verniers, Surface Finish Equipment ;Feeler Gauges, Surface Finish Equipment ;Height Gauge, Surface Finish Equipment ;Hole Gauges, Surface Finish Equipment ;Profile Gauges, Surface Finish Equipment ;Protractors, Surface Finish Equipment ;Radius Gauges, Surface Finish Equipment ;Rules, Surface Finish Equipment ;Slip Gauges, Surface Finish Equipment ;Thread Gauges, Surface Finish Equipment ;Try Squares, Tolerancing Tool, Trolly, Various Mask Cartridges, Vice Mounted Tables, Computer, Computer Workdesk, GMP Guideline Book, White Board, White Board Duster, White Board Marker, White Screen, Flip Charts, Laser Pointer, Permanent Markers, MS Office, Projector, Sound System With Mike
4	**Coordinate with**	• Manage Supervisor- Reportee Relationship and	Computer, Computer Workdesk,

	Shift Supervisor, cross functional teams and within the team **Theory Duration** (hh:mm) 10:00 **Practical Duration** (hh:mm) 05:00 **Corresponding NOS Code** LFS/N0204	identify Partnering Opportunities at work; know and follow General reporting process, protocol and escalation policy. Understand Importance of reports and communication with Supervisor including shift handover • Learn and Use techniques for Collaborating with Other Groups and Divisions in order to achieve organizational goals • Learn and follow the conceptual and practical skills required by Fitter mechanical in Audits: • Importance of cGMP/QMS/ SOP related documentation • Method to Respond to Audit Queries • How to Face Internal Audit Interactions • Use of IT in communication and coordination • Learn and practice Related Core Skills and Professional Skills: Reading, writing, listening, speaking, Analytical thinking, problem solving, decision making, customer centricity • Understand the work output requirements • Understand the quality standards to be maintained • Proactively inform supervisor on issues requiring intervention • Deliver quality work on time and report any anticipated reasons for delays resolve conflicts • Interact with Immediate Supervisor ➢ receive work instructions from reporting supervisor ➢ communicate to reporting supervisor about process-flow improvements and production defects received from previous process ➢ communicate any potential hazards or expected process disruptions ➢ communicate maintenance and repair schedule proactively to the supervisor ➢ handover completed work to supervisor • Interact with colleagues within the team • work as a team with colleagues and share work as per their or own work load and skills • communicate and discuss work flow related difficulties in order to find solutions with mutual agreement • Interact with colleagues from cross functional teams ➢ receive feedback from Quality Control and Quality Assurance and rework in order to complete work on time ➢ provide support to Quality Assurance team during audits ➢ coordinate with maintenance team for any breakdowns and for preventive and corrective maintenance ➢ Coordinate with Stores to receive material in time	GMP Guideline Book, White Board, White Board Duster, White Board Marker, White Screen, Flip Charts, Laser Pointer, Permanent Markers, MS Office, Projector, Sound System With Mike, Material Safety Data Sheet, Sample Job Card, Sample Log Books, Sample Machine Histrory Record, Sample Machine Inspection Record, Sample Maintenance Schedule, Sample Shift Schedule
5	**Transportation of**	• Follow correct methods of handling and moving	ABC Type Fire Extinguisher,

	Material and tools **Theory Duration** (hh:mm) 03:00 **Practical Duration** (hh:mm) 07:00 **Corresponding NOS Code** Bridge Module	of material, tools, machine and parts • Perform Basic physical activities like climbing, lifting, stooping, walking etc. • Attach slings, ropes, cables to the object like bundles • Learn and follow operations for fork lifting • Learn and follow the methods of driving, transport machineries and its maintenance • Learn how to load & stack the stock, tools & transport it safely using trolley, forklift etc • inspect the obstructions in the path of transportation	Assembling Operations Tools: Bolts, Assembling Operations Tools: Cap Screws, Assembling Operations Tools: External Circlips, Assembling Operations Tools: Internal Circlips, Assembling Operations Tools: Nuts, Assembling Operations Tools: Nuts, Bolts, Machine Screws, Cap Screws ; External Circlips, Internal Circlips, Special Clips;Tab Washers, Locking Nuts, Wire Locks, Shimming And Packing, Assembling Operations Tools:Foiler, Assembling Operations Tools:Hammer, Assembling Operations Tools:Locking Nuts, Assembling Operations Tools:Machine Screws, Assembling Operations Tools:Plier, Assembling Operations Tools:Shimming And Packing, Assembling Operations Tools:Special Clips, Assembling Operations Tools:Tab Washers, Assembling Operations Tools:Wire Locks, Chemical Absorbent Roll, Conventional Lathe Machine, Conventional Milling Machine, Drilling Machine: Pedestal Drilling Machine, Drilling Machine: Portable, Eye Washer With Sprinkler, Face Mask (Full Face), Face Mask (Half Face), Flexible Shaft Grinding Machine, Flexible Shaft Grinding Machine, Forklift, Generator, Geometric Dimensioning Tool, Gloves({Heat, Acid, Chemical} Resitant), Gloves(Nitrile), Grinding Machine: Ag4 Grinder, Gum Boots, Helmet, Lab Coat, Manual Bottle Eye Washer, Marking Equipments: Marking Equipments: Protractor, Marking Equipments: Punches, Marking Equipments: Scribers, Marking Equipments: Scribers, Punches, Scribing Blocks, Squares, Protractor, Marking Equipments: Scribing Blocks, Marking Equipments: Squares, Measuring Equipments : External Micrometers, Measuring Equipments : Vernier/Digital/Dial Caliper, Pvc Apron, Safety Goggles, Safety

			Shoes, Self Contained Breathing Apparatus, Surface Finish Equipment ;Bore Gauges, Surface Finish Equipment ;Depth Micrometers, Surface Finish Equipment ;Depth Verniers, Surface Finish Equipment ;Feeler Gauges, Surface Finish Equipment ;Height Gauge, Surface Finish Equipment ;Hole Gauges, Surface Finish Equipment ;Profile Gauges, Surface Finish Equipment ;Protractors, Surface Finish Equipment ;Radius Gauges, Surface Finish Equipment ;Rules, Surface Finish Equipment ;Slip Gauges, Surface Finish Equipment ;Thread Gauges, Surface Finish Equipment ;Try Squares, Tolerancing Tool, Trolly, Various Mask Cartridges, Vice Mounted Tables, Computer, Computer Workdesk, GMP Guideline Book, White Board, White Board Duster, White Board Marker, White Screen, Flip Charts, Laser Pointer, Permanent Markers, MS Office, Projector, Sound System With Mike, Material Safety Data Sheet, Sample Job Card, Sample Log Books, Sample Machine Histrory Record, Sample Machine Inspection Record, Sample Maintenance Schedule, Sample Shift Schedule
6	**Information Security** **Theory Duration** (hh:mm) 01:00 **Practical Duration** (hh:mm) 00:00 **Corresponding NOS Code** Bridge Module	• how to deal with confidential matters • various types of documents and data • handling of sensitive data • way to communicate and disciplined behaviour to maintain information security	Computer, Computer Workdesk, GMP Guideline Book, White Board, White Board Duster, White Board Marker, White Screen, Flip Charts, Laser Pointer, Permanent Markers, MS Office, Projector, Sound System With Mike
7	**Ensure Healthy, Safe and Secure Workplace** **Theory Duration**	• Learn the Basic Concepts of Safety including Hazards, Accidents, Safety Signs and Signals and Henriech Pyramid and follow and practice same at shop floor • Know about Water Systems at Plant,	ABC Type Fire Extinguisher, Assembling Operations Tools: Bolts, Assembling Operations Tools: Cap Screws, Assembling Operations Tools: External

	(hh:mm) 15:00 **Practical Duration** (hh:mm) 05:00 **Corresponding NOS Code** LFS/N0101	Engineering related tools and techniques to operate the machine safely. Understand the clean room classifications and requirements, Know and follow Clean room behaviour practices • Use Material Data Safety Sheet, and follow the Process of Safety Analysis. Know and follow the Fire Safety concepts and prepare oneself to act in case of Fire Emergency at shop floor. Know about various PPEs used in different production operations and do Job Safety Analysis for Various production machines/ equipment and provide these critical information to concerned team members. • Comply with health and safety, environmental and other relevant regulations and guidelines at work • Adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing broaching operations • Ansure work area is clean and safe from hazards as given below: **Hazards:** use of power tools, trailing leads or hoses, damaged or badly maintained tools and equipment; using files with damaged or poor fitting handles; using machine tools; handling of oils and grease; misuses of tools; not following laid-down maintenance procedures • Learn and follow the Basic Concepts and practical skills for managing Emergency Procedures and how to do first aid • Learn and practice Related Core Skills and Professional Skills: Reading, writing, listening, speaking, Plan and organize, Critical thinking, problem solving, decision making, customer centricity	Circlips, Assembling Operations Tools: Internal Circlips, Assembling Operations Tools: Nuts, Assembling Operations Tools: Nuts, Bolts, Machine Screws, Cap Screws ; External Circlips, Internal Circlips, Special Clips;Tab Washers, Locking Nuts, Wire Locks, Shimming And Packing, Assembling Operations Tools:Foiler, Assembling Operations Tools:Hammer, Assembling Operations Tools:Locking Nuts, Assembling Operations Tools:Machine Screws, Assembling Operations Tools:Plier, Assembling Operations Tools:Shimming And Packing, Assembling Operations Tools:Special Clips, Assembling Operations Tools:Tab Washers, Assembling Operations Tools:Wire Locks, Chemical Absorbent Roll, Conventional Lathe Machine, Conventional Milling Machine, Drilling Machine: Pedestal Drilling Machine, Drilling Machine: Portable, Eye Washer With Sprinkler, Face Mask (Full Face), Face Mask (Half Face), Flexible Shaft Grinding Machine, Flexible Shaft Grinding Machine, Forklift, Generator, Geometric Dimensioning Tool, Gloves({Heat, Acid, Chemical} Resitant), Gloves(Nitrile), Grinding Machine: Ag4 Grinder, Gum Boots, Helmet, Lab Coat, Manual Bottle Eye Washer, Marking Equipments: Marking Equipments: Protractor, Marking Equipments: Punches, Marking Equipments: Scribers, Marking Equipments: Scribers, Punches, Scribing Blocks, Squares, Protractor, Marking Equipments: Scribing Blocks, Marking Equipments: Squares, Measuring Equipments : External Micrometers, Measuring Equipments : Vernier/Digital/Dial Caliper, Pvc Apron, Safety Goggles, Safety Shoes, Self Contained Breathing Apparatus, Surface Finish Equipment ;Bore Gauges, Surface Finish Equipment

			;Depth Micrometers, Surface Finish Equipment ;Depth Verniers, Surface Finish Equipment ;Feeler Gauges, Surface Finish Equipment ;Height Gauge, Surface Finish Equipment ;Hole Gauges, Surface Finish Equipment ;Profile Gauges, Surface Finish Equipment ;Protractors, Surface Finish Equipment ;Radius Gauges, Surface Finish Equipment ;Rules, Surface Finish Equipment ;Slip Gauges, Surface Finish Equipment ;Thread Gauges, Surface Finish Equipment ;Try Squares, Tolerancing Tool, Trolly, Various Mask Cartridges, Vice Mounted Tables, Computer, Computer Workdesk, GMP Guideline Book, White Board, White Board Duster, White Board Marker, White Screen, Flip Charts, Laser Pointer, Permanent Markers, MS Office, Projector, Sound System With Mike, Material Safety Data Sheet, Sample Job Card, Sample Log Books, Sample Machine Histrory Record, Sample Machine Inspection Record, Sample Maintenance Schedule, Sample Shift Schedule
8	**Internship** **Theory Duration** (hh:mm) 00:00 **Practical Duration** (hh:mm) 100:00 **Corresponding NOS Code** LFS/N0260, LFS/N0261, LFS/N0204, LFS/N0101	Learn the practical on the job skills for: • Perform fitting and assembly operations on metal components • Perform maintenance activities on mechanical equipment / machines • Coordinate with shift supervisor, cross functional teams and within the team • Maintain a healthy, safe and secure working environment in the life sciences facility	
	Total Duration **Theory Duration 83:00** **Practical Duration**	**Unique Equipment Required:**	

	177:00

Grand Total Course Duration: _260 Hours _00__ Minutes
(This syllabus/ curriculum has been approved by Life Sciences Sector Skill Development Council.)

Annexure1: Trainer Prerequisites for Job role: "Fitter Mechanical – Life Sciences" mapped to Qualification Pack: "LFS/ Q 0215 Ver1.0"

Sr. No.	Area	Details
1	**Job Description**	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "LFS/Q0215 Ver1.0".
2	**Personal Attributes**	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	**Minimum Educational Qualifications**	10th Pass/ ITI
4a	**Domain Certification**	Certified for Job Role: "Fitter Mechanical - Life Sciences" mapped to QP: "LFS/Q 0213 Ver1.0". Minimum accepted score is 70% as per LSSSDC guidelines.
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "SSC/1402". Minimum accepted score is 70% as per LSSSDC guidelines.
5	**Experience**	Preferably Minimum Five (5) years' experience in life sciences manufacturing (Maintenance) occupation for non-trained and non-qualified talent Minimum Three (3) years' experience with Fitter Mechanical -Life Sciences Level-3 qualified

Annexure2: Assessment Criteria

Assessment Criteria	
Job Role	Fitter Mechanical – Life Sciences
Qualification Pack	LFS/Q0213
Sector Skill Council	Life Sciences Sector Skill Development Council

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on the assessment criteria below
5	To pass the Qualification Pack , every trainee should score a minimum of 50% aggregate in all NOS
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

				Marks Allocation	
Assessment Outcome	**Assessment Criteria of Outcomes**	**Total Marks (400)**	**Out Of**	**Theory**	**Skills Practical**
LFS/ N 0260 (Perform fitting and assembly operations on metal components)	PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work	100	3	1	2
	PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing broaching operations		4	1	3
	PC3. ensure work area is clean and safe from hazards		2	0	2
	PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition		2	0	2
	PC5. ensure that all machines and machine tools are secured at all times		2	0	2
	PC6. determine job requirement from job specification documents obtained from valid sources		3	0	3
	PC7. establish the procedures to complete the general machining, fitting or assembling operations		3	0	3
	PC8. obtain the appropriate equipment, parts and accessories for the general machining, fitting or assembling operation		2	0	2
	PC9. check that all measuring equipment is within calibration date		3	0	3
	PC10. prepare/determine suitable datums from which to mark out (eg. choosing a machine face or filing a flat face as a datum)		3	0	3

	PC11. apply a marking medium to enhance clarity of the marking out		3	0	3
	PC12. use an appropriate method of marking out (eg. direct marking using instruments, use of templates or tracing/transfer methods)		4	0	4
	PC13. use a range of marking out equipment (eg. rules, squares, scribers, vernier instruments)		3	0	3
	PC14. mark out a range of features		3	0	3
	PC15. cut and shape the materials to the required specification, using appropriate tools and techniques		6	2	4
	PC16. use a range of hand fitting methods for fitting operations		4	0	4
	PC17. Use a range of manually operated machines for performing machining operations		3	0	3
	PC18. use appropriate methods and techniques to assemble and secure the components and sub-assemblies in their correct positions		6	2	4
	PC19. drill, tap and ream locating holes as required to permanently locate components		4	0	4
	PC20. fasten components permanently using methods such as using engineered fasteners, applying adhesives, soldering and brazing		3	0	3
	PC21. produce mechanical assemblies as per job specifications		6	2	4
	PC22. dismantle mechanical assemblies without damage to components and/or subassemblies		4	0	4
	PC23. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		3	0	3
	PC24. keep the work area in a safe and tidy condition during and on completion of the manufacturing activities		2	0	2
	PC25. return all tools and equipment to the correct location on completion of the fitting activities support the customer remotely over the internet to test potential solutions		3	0	3
	PC26. perform the necessary checks for dimensional accuracy		5	1	4
	PC27. use the appropriate measuring equipment for checking activities		3	0	3
	PC28. produce components within all of the applying standards		5	1	4
	PC29. generate stage inspection reports		3	0	3
	Total		100	10	90
LFS/ N	PC1. comply with health and safety, environmental and other relevant	100	3	1	2

0261 (Perform maintenance activities on mechanical equipment/ machinery)	regulations and guidelines at work				
	PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fabrication and fitting operations		4	1	3
	PC3. work following laid down procedures and instructions		3	1	2
	PC4. ensure work area is clean and safe from hazards		2	0	2
	PC5. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition		2	0	2
	PC6. follow all relevant setting up and operating specifications for the products or mechanical equipment being commissioned		3	1	2
	PC7. follow the defined procedures and set up the equipment correctly ensuring that all operating parameters are achieved		3	1	2
	PC8. obtain job specifications and requirements from valid sources and find out the fault		2	0	2
	PC9. obtain and interpret drawings, specifications, manufacturers' manuals and other documents needed in the maintenance process		3	1	2
	PC10. follow the procedure to be adopted to establish the background of the fault and the tools to be used		3	1	2
	PC11. evaluate various types of information available for fault diagnosis		3	0	3
	PC12. evaluate sensory information to assess likely faults eg. sound, visual		3	0	3
	PC13. collect evidence regarding the fault from the sources using a range of diagnostic equipment and techniques		3	0	3
	PC14. apply monitoring or testing procedures to help in the fault diagnosis using a range of test equipment		4	1	3
	PC15. relate previous reports/records of similar fault conditions		2	0	2
	PC16. evaluate the likely risk of running the equipment with the displayed fault, and the effects the fault could have on health and safety, and on the overall process or system		3	0	3
	PC17. carry out the maintenance activities in the specified sequence and in an agreed timescale		5	1	4
	PC18. carry out maintenance activities on various equipment		4	0	4
	PC19. perform dismantling processes mechanical equipment using appropriate method or technique in order to replace defective components		4	0	4

	PC20. re-assemble the components using appropriate methods, and adjust them to meet the operating specification		5	1	4
	PC21. carry out servicing and maintenance techniques as applicable		5	1	4
	PC22. replace or refit basic hydraulic and pneumatic components		4	0	4
	PC23. identify requirements for welding, machining, electric or electronic repair and handover to the relevant personal after following due process		3	0	3
	PC24. conduct a trial run of the equipment at full power/speed/flow		3	0	3
	PC25. confirm that the produced component/process outcomes meet specifications		3	0	3
	PC26. monitor and record measurements and observations		3	0	3
	PC27. review and update maintenance procedures and plans		3	0	3
	PC28. deal with equipment malfunction and rectify faults during the breakdown servicing process as appropriate		4	1	3
	PC29. identify areas of improvements in the various maintenance services and implement the improvement activities agreed upon by the relevant authorities		3	0	3
	PC30. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve to ensure zero idle time of machine/ equipment		3	0	3
	PC31. leave the work area in a safe and tidy condition on completion of the manufacturing activities		2	0	2
	Total		100	12	88
LFS/N0204 (Coordinate with Shift Supervisor, cross functional teams and within the team)	PC1. understand the work output requirements	100	12	6	6
	PC2. understand the quality standards to be maintained		12	6	6
	PC3. proactively inform supervisor on issues requiring intervention		12	6	6
	PC4. comply with company policy and rule		13	6	7
	PC5. deliver quality work on time and report any anticipated reasons for delay		13	6	7
	PC6. be able to resolve conflicts		12	6	6
	PC7. multi-task relevant activities to align with team goals		12	6	6
	PC8. put team over individual goals		14	6	8
	Total		100	48	52
LFS/N0101 (Maintain a healthy, safe and secure	PC1. observe and comply with the company's current health, safety and security policies and procedures	100	10	5	5
	PC2. while carrying out work, use		10	5	5

working environment in the life sciences facility)	appropriate safety gears like head gear, masks, gloves and other accessories as mentioned in the guidelines				
	PC3. report any identified breaches in health, safety, and security policies and procedures to the designated person		10	5	5
	PC4. responsible for maintaining discipline at the shop-floor/ production area		10	5	5
	PC5. identify and correct any hazards that the individual can deal with safely, competently and within the limits of their authority		10	5	5
	PC6. adhere and comply to storage and handling guidelines for hazardous material		10	5	5
	PC7. identify and recommend opportunities for improving health, safety, and security to the designated person		10	5	5
	PC8. complete any health, safety and security activities like safety drills and prepare records legibly and accurately		10	4	6
	PC9. report any hazards that the individual is not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected		10	4	6
	PC10. follow the company's emergency procedures promptly, calmly, and efficiently		10	5	5
	Total		100	48	52