GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

FITTER

(Duration: Two Years)

CRAFTSMEN TRAINING SCHEME (CTS)
NSQF LEVEL- 5

SECTOR – PRODUCTION & MANUFACTURING

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOMES	**ASSESSMENT CRITERIA**
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1. 1. Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1. 2. Recognize and report all unsafe situations according to site policy.
	1. 3. Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1. 4. Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1. 5. Identify and observe site policies and procedures in regard to illness or accident.
	1. 6. Identify safety alarms accurately.
	1. 7. Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1. 8. Identify and observe site evacuation procedures according to site policy.
	1. 9. Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1. 10. Identify basic first aid and use them under different circumstances.
	1. 11. Identify different fire extinguisher and use the same as per requirement.
	1. 12. Identify environmental pollution & contribute to avoidance of same.
	1. 13. Take opportunities to use energy and materials in an environmentally friendly manner
	1. 14. Avoid waste and dispose waste as per procedure
	1. 15. Recognize different components of 5S and apply the same in the working environment.
2. Understand, explain different mathematical calculation & science in the field of study including basic electrical and	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.

apply in day to day work.*[Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Statistics, Centre of gravity, Power transmission, Pressure]*	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply given tolerance.
	2.5 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7 Explain basic electricity, insulation &earthing.
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]*	3. 1. Read & interpret the information on drawings and apply in executing practical work.
	3. 2. Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly /maintenance parameters.
	3. 3. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
4. Select and ascertain measuring instrument and measure dimension of components and record data.	4.1 Select appropriate measuring instruments such as micrometers, vernier calipers, dial gauge, bevel protector and height gauge (as per tool list).
	4.2 Ascertain the functionality & correctness of the instrument.
	4.3 Measure dimension of the components & record data to analyse the with given drawing/measurement.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1 Explain the concept of productivity and quality tools and apply during execution of job.
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3 Knows benefits guaranteed under various acts
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution.

available resources.	6.2 Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7. 1. Explain personnel finance and entrepreneurship.
	7. 2. Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
	7. 3. Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and organize the work related to the occupation.	8. 1. Use documents, drawings and recognize hazards in the work site.
	8. 2. Plan workplace/ assembly location with due consideration to operational stipulation
	8. 3. Communicate effectively with others and plan project tasks
	8. 4. Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.

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SPECIFIC OUTCOME	
Semester-I	
LEARNING/ ASSESSABLE OUTCOMES	**ASSESSMENT CRITERIA**
9. Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy. *[Basic fitting operation – marking, Hacksawing, Chiseling, Filing, Drilling, Taping and Grinding etc. Accuracy: ± 0.25mm]*	9. 1 Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	9. 2 Select raw material and visual inspect for defects.
	9. 3 Mark as per specification applying desired mathematical calculation and observing standard procedure.
	9. 4 Measure all dimensions in accordance with standard specifications and tolerances.
	9. 5 Identify Hand Tools for different fitting operations and make these available for use in a timely manner.
	9. 6 Prepare the job for Hacksawing, chiselling, filing, drilling, tapping, grinding.
	9. 7 Perform basic fitting operations viz., Hacksawing, filing, drilling, tapping and grinding to close tolerance as per specification to make the job.
	9. 8 Observe safety procedure during above operation as per standard norms and company guidelines.
	9. 9 Check for dimensional accuracy as per standard procedure.
	9. 10 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
10. Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting.	10. 1 Identify Hand Tools for Sheet Metal work, Soldering, Brazing & riveting and make these available for use in a timely manner.
	10. 2 Mark and develop various forms as per drawing using sheet metals.
	10. 3 Make of simple items with sheet metal as per drawing.
	10. 4 Prepare the job for Soldering, Brazing &riveting .
	10. 5 Identify different type of rivets and use as per requirement.
	10. 6 Identify tools for drilling and use these tools.
	10. 7 Mark according to drawing.
	10. 8 Drill through holes on the job.
	10. 9 Solder, Braze and Rivet to prepare a job as per given drawing / sample following standard practices.
	10. 10 Observe safety procedure during riveting as per standard norms and company guidelines.
11. Join metal components by	11.1 Identify Tools and equipments for riveting and make

riveting observing standard procedure.	these available for use in a timely manner.
	11.2 Prepare the job for lap and butt joint.
	11.3 Identify different type of rivets and use as per requirement.
	11.4 Identify tools for drilling and use these tools.
	11.5 Mark according to drawing.
	11.6 Drill through holes on the job.
	11.7 Rivet to prepare a job as per given drawing / sample following standard practices.
	11.8 Observe safety procedure during riveting as per standard norms and company guidelines.
12. Join metal component by arc welding observing standard procedure.	12. 1. Identify different components/parts of arc welding machine, collect desired information and set each components/parts as per standard procedure.
	12. 2. Observe safety/ precaution during operation.
	12. 3. Select appropriate material & plan for arc welding.
	12. 4. Weld metal parts / mechanical components as per specification observing standard procedure.
	12. 5. Check joined part portion to ascertain proper welding.
13. Cut and join metal component by gas (oxy-acetylene)	13.1 Identify different components/parts of Gas (oxy-acetylene) machine, collect desired information and set each components/parts as per standard procedure.
	13.2 Observe safety/ precaution during operation.
	13.3 Select appropriate material & plan for gas cutting & joining operation.
	13.4 Cut & join metal parts / mechanical components as per specification observing standard procedure.
	13.5 Check cut portion/ joined part to ascertain proper welding.

Semester-II

LEARNING/ ASSESSABLE OUTCOMES	ASSESSMENT CRITERIA
14. Produce components by different operations and check accuracy using appropriate measuring instruments.*[Different Operations - Drilling, Reaming, Taping, Dieing; Appropriate Measuring Instrument – Vernier, Screw Gauge, Micrometer]*	14.1 Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	14.2 Plan work in compliance with standard safety norms.
	14.3 Produce component by observing standard procedure.
	14.4 Check the dimensions of the produced components to ensure dimensions are within prescribed limit.
	14.5 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.

15. Make different fit of components for assembling as per required tolerance observing principle of interchangeability and check for functionality. *[Different Fit – Sliding, Angular, Step fit, 'T' fit, Square fit and Profile fit; Required tolerance: ±0.04 mm, angular tolerance: 30 min.]*	15.1 Recognize general concept of Limits, Fits and tolerance necessary for fitting applications and functional application of these parameters.
	15.2 Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	15.3 Set up workplace/ assembly location with due consideration to operational stipulation
	15.4 Plan work in compliance with standard safety norms and collecting desired information.
	15.5 Demonstrate possible solutions and agree tasks within the team.
	15.6 Make components according to the specification for different fit using a range of practical skills and ensuring interchangeability of different parts.
	15.7 Assemble components applying a range of skills to ensure proper fit.
	15.8 Check functionality of components.
16. Produce components involving different operations on lathe observing standard procedure and check for accuracy. *[Different Operations – facing, plain turning, step turning, parting, chamfering, shoulder turn, grooving, knurling, boring, taper turning, threading (external 'V' only)]*	16.1 Ascertain basic working principles and safety aspect of lathe machine.
	16.2 Understand functional application of different levers, stoppers, adjustment etc.
	16.3 Identify different lubrication points and lubricants, their usage for application in lathe machine as per machine manual.
	16.4 Identify different work and tool holding devices and collect information for functional application of each device.
	16.5 Mount the work and tool holding devices with required alignment and check for its functional usage to perform lathe operations.
	16.6 Solve problem by applying basic methods, tools, materials and information during setting.
	16.7 Observe safety procedure during mounting as per standard norms.
	16.8 Produce components observing standard procedure.
	16.9 Check accuracy/ correctness of job using appropriate equipment/gauge.
	16.10 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
17. Plan&perform simple repair, overhauling of different machines and check for functionality. *[Different*	17.1 Ascertain and select tools and materials for the repair, overhauling and make this available for use in a timely manner.

Machines – Drill Machine, Power Saw, Bench Grinder and Lathe]	17.2 Plan work in compliance with standard safety norms.
	17.3 Demonstrate possible solutions and agree tasks within the team.
	17.4 Select specific parts to be repaired and ascertain for appropriate material and estimated time.
	17.5 Repair, overhaul and assemble the parts in the machine with the help of blue print.
	17.6 Check for functionality of part and ascertain faults of the part/ machine in case of improper function.
	17.7 Rectify faults of assembly.

Semester-III

LEARNING/ ASSESSABLE OUTCOMES	ASSESSMENT CRITERIA
18. Make &assemble components of different mating surfaces as per required tolerance by different surface finishing operations using different fastening components, tools and check functionality. *[Different Mating Surfaces – Dovetail fitting, Radious fitting, Combined fitting; Different surface finishing operations – Scraping, Lapping and Honing; Different fastening components – Dowel pins, screws, bolts, keys and cotters; Different fastening tools-hand operated & power tools, Required tolerance - ±0.02mm, angular tolerance ± 10 min.]*	18. 1 Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	18. 2 Plan work in compliance with standard and collecting necessary information.
	18. 3 Set up workplace/ assembly location with due consideration to operational stipulation
	18. 4 Demonstrate possible solutions and agree tasks within the team.
	18. 5 Produce different components with appropriate accuracy by observing standard procedure& method as per specification using appropriate tools & machines.
	18. 6 Perform scraping and lapping of components to obtain required surface finish of different mating surface.
	18. 7 Comply with safety rules when performing the above operations.
	18. 8 Check tolerance and accuracy of components as defined with appropriate instruments observing standard procedure.
	18. 9 Assemble different components using different fastening components, tools and check the functionality.
19. Make different gauges by using standard tools & equipment and checks for specified accuracy. *[Different Gauges – Snap gauge, Gap*	19.1 Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	19.2 Plan work in compliance with standard safety norms.
	19.3 Produce gauge by observing appropriate method and as per specification of drawing.