सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
DEVELOPMENT COMMISSIONER
MINISTRY OF MICRO, SMALL & MEDIUM ENTERPRISES
MSME TECHNOLOGY CENTRE

MODEL CURRICULUM

Qualification Name:

JR. TECHNICIAN - INSPECTION & QUALITY CONTROL

Qualification Code:

Version: 1.0

NSQF Level: 3

Model Curriculum Version: 1.0

Submitted By:
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COURSES / MODULE TEMPLATE

COURSE NAME: Create Part Drawing using Auto-CAD

COURSE CODE: MSME/CCIQC-01

COURSE OUTCOMES:

After completion of course Student should be able to

- Explain the application of engineering drawing.
- Construct orthographic Projections giving proper dimensioning with title block using appropriate line type and scale for any geometrical figure in Auto CAD
- Explain various drawing Equipment's.
- Understand of Engineering Dimensioning method and their application
- Distinguish between Isometric view and Isometric projections.
- Explain about GD&T
- Create 2D geometric sketches by using Auto CAD Software
- Develop 3D modeling by using advanced command
- Understand design generative & interactive drafting

THEORY HOURS: 30 PRACTICAL HOURS: 60 THEORY MARKS: NA PRACTICAL MARKS:100

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	TH hours	Marks	
Unit I	**Drawing equipment's**	After completion of unit Student should be able to Use of Drawing Instrumentand Purpose. Use of different grade ofPencils Under stand of drawingsheet lay out. Explain and demonstrateuse of scales.	**Explain the use of,** Drawing board, T – square Set square, Mini drafter, Instrument box, Protractors, French curves Identify the different grades of pencils HB, H, 2H, 3H.Classify the different sizes of drawing sheets according to B.I.S. Describe the layout of Drawing sheets and their contents. Give idea about Letters and numerals Explain the use of scales – Enlarging, Reducing, full scale and representative fraction.	**6**	**10**	
Unit II	**Dimensioning Techniques**	After completion of unit Student should be able to Identify and use of different types of lines. Use of co-ordinatedimensioning	**State the types of lines** and their uses. Identify different dimensioning methods. Use Chain, parallel and combined dimensioning. Use aligned and unidirectional system of dimensioning in given situation.	**6**	**10**	

		• Under stand of dimensioning Diameter, Radii, Chords, angles.	Use co-ordinate dimensioning, methods of dimensioning Diameter, Radii, Chords, angles.			
Unit III	**Recognize the points in various quadrants**	After completion of unit Student should be able to • Understand of fourquadrants. • Use of different Plane • Understand of front view, top view and side view	Explain all four quadrants Identify Horizontal plane, Vertical plane and Profile plane. Explain the projection of points – front view, top view and side view (both left and right).	6	**10**	
Unit IV	**Development of surfacesof objects**	After completion of unit Student should be able to • Use of parallel line andradial line methods • Understand of Development of surfaces with section s	**Illustrate the Development** of surfaces byparallel line and radial line methods Draw the development of surfaces of geometrical objects and utility objects Draw Development of surfaces w Draw development of Solids resting completely on its base	**6**	**10**	
Unit V	**Orthographic projection of machine parts**	After completion of unit Student should be able to • Meaning of orthographic projection	**State Meaning** of orthographic projection Draw elevation, plan and side elevation of the machine parts like stepped block, forklever, bearing block, etc.	**6**	**10**	
Unit VI	**Isometric projection and views ofsolids and machine parts**	After completion of unit Student should be able to • Distinguish between Isometric view and Isometric projections • Understand of Use of different Isometric view of different geometrical objects and machine parts	**Describe the use of Isometric** scale Distinguish between Isometric view and Isometric projections To draw the Isometric view of different geometrical objects and machine parts Convert orthographic views into isometricviews.	**6**	**10**	
Unit VII	**Temporary fastenings used in engineering applications**	After completion of unit Student should be able to • Use of Drawing Instrument and Purpose. • Use of different grade of Pencils • Under stand of drawing sheet lay out. Explain and demonstrate use of	**Distinguish** between temporary Draw the profiles of different screw threads Show the representation of screw threadswith conventional symbols Draw the three views of hexagonal headedbolt with hexagonal nut Draw the two views of square headed bolt	**6**	**10**	

		scales	with square nut			
Unit VIII	**Preparation of assembly drawing**	After completion of unit Studentshould be able to Understand of assembly drawing Identify parts of theassembly Parts drawing	hinge C-clamp Drill base and table Tool makers clampDrill jig Plumber block, etc.	**6**	10	
Unit IX	**Surface finish symbols**	After completion of unit Studentshould be able to Understand of symbols of surface finish. Understand of machining allowance Under stand of special drawing instruction.	Indication Special surface Direction of lay Machining allowance Position of symbol Symbols with inscriptions Additional indications	**6**	**10**	
Unit X	**Preparation of detail drawing, assembly and part list**	After completion of unit Studentshould be able to Understand of drawing of Jigs & fixture. Able to draw differentparts of tools.	Jigs & fixtures Screw jack Pipe vice Tail stock Swivel bearing Plumber blockMachine vice Shaper tool head Machine elements	**6**	**10**	

NOS /Module: Demonstrate the working Principle of Machine Tools

NOS /Module Code: MSME/CCIQC/02

Outcomes:

After completion of course Student should be able to:

1. Understand about the basic norms of an organization
2. Understand about the environmental sustainability
3. Understand an implement various activities involved in 5S
4. Understand about the safety rules
5. Explain the use of first aid and safety equipment/PPE
6. Understand the Waste disposal techniques
7. Explain Lathe Machine and its parts
8. Explain various operations performed on conventional Lathe machine
9. Calculate various cutting parameters like Feed, RPM, Machining time, and tapper angle etc.
10. Calculate area and volume of various Geometry
11. Calculate weight of material and cost estimation.

Theory Hours: 30 **Practical Hours: 60** **Theory Marks: 100** **Practical Marks: NA**

Unit No.	**Unit Name**	**Unit level outcomes**	**Contents (chapters/topics)**	**PR Hours**	**PR Marks**
UNIT-I	Introduction	At the end of this Unit the student should be able to: • Understand about Organizational rules & regulation • Understand about the source of renewal energy resources • Understand about the Environmental Sustainability • understand and explain about 5S • Understand about the various activities involved in 5S • Implement 5S in the work area.	Introduction to Organization/ Institute (MSME Technology Centre) Rules & Regulation, mandate, mission and policies, Renewal energy resources and Environmental Sustainability (Benefits and Issues) Introduction & purpose of 5S, Creates a Visual Factory, The 5S Cycle, and 5S Activities, 5S Program Steps :Sort, Straighten, Shine, Standardize and Sustain	10	15
UNIT-II	Occupational health and safety	At the end of this Unit the student should be able to: • Understand about safety rules • Understand the use of first aid and safety equipment • Understand the importance of occupational health and safety • Understand the environment	Health & Safety: Introduction to safety equipment's and their uses, Introduction of first aid, operation of Electrical mains, Occupational Safety & Health, Importance of housekeeping & good shop floor practices, Disposal procedure, Disposal of waste materials like	10	15

		guidelines • Understand the Waste disposal techniques • Understand the use of PPE	cotton waste, metal chips/burrs etc, personal protective equipment's (PPE), Basic injury prevention, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message		
UNIT-III	cutting tools and Conventional Lathe machine and Operation	After completion of unit Student should be able to • Explain pedestal grinding machine • Understand and explain single point cutting tool • Tool terminologies • Explain lathe machine • Describe the lathe machine parts & accessories • Understand about the different types of turning operations • Explain the methods of taper turning • Explain thread cutting techniques.	Bench & pedestal grinders, features. Wheel dressers, Safety. Construction, Cutting Tool shape & Geometry, Work Holding Devices, Cutting Speed feed and depth of cut. Conventional lathe machine and its parts, Specification of a lathe Machine and its parts, work and tool holding devices, lathe machine operations like: Plain & Step turning, Parting, Boring, Grooving, Facing, Threading, Profile, Drilling, Tapping, Reaming, Counter boring, Knurling, Methods of Taper turning and Taper turning attachment	10	20
UNIT-IV	cutting tools, Conventional Milling machine and its Operation	After completion of unit Student should be able to • Explain pedestal grinding machine • Understand and explain single point cutting tool • Tool terminologies • Explain milling machine • Describe the milling machine parts & accessories • Understand about the different types of Milling operations.	Bench & pedestal grinders, features. Wheel dressers, Safety. Construction, Cutting Tool shape & Geometry, Work Holding Devices, Cutting Speed feed and depth of cut. Conventional milling machine and its parts, Specification of a milling Machine and its parts, work and tool holding devices, milling machine operations like: Plain & Step Milling, Parting, Boring, Grooving, Facing, Threading, Profile, Drilling, Tapping, Reaming, Counter boring, Pocketing, slotting etc.	10	20

UNIT-V	Basics of workshop Calculation	After completion of unit Student should be able to • Explain systems (British & metric) of units, measurement, relationship & conversion problems • Explain the methods of finding Density and percentage • Calculate Percentage & density • Explain about Mass, weight and density • Understand the fundamentals of Algebra and learning to use calculator. • Explain Pythagoras theorem	Introduction, systems (British & metric) of units, measurement, relationship & conversion problems, Concept of density, mass & weight. Density and relative density and comparison between them, Fundamental algebra and simplification problems, Learning to use calculator , Pythagoras theorem, Area, perimeter and other dimension , Exercise based on trigonometric application like measurement of angles in degrees, grades and radians and their conversions.	10	20
UNIT-VI	Basics of Quality Assurance	After completion of unit Student should be able to • Understand about the Quality • Understand the quality organization • Understand about the quality system • Explain 7 QC Tools	**Introduction:** Importance and Concepts of quality , quality assurance, International and Indian quality organizations, Quality System, Need for ISO 9000 and Other Quality systems and 7 QC tools.	10	10

COURSES / MODULE TEMPLATE

COURSE NAME: Asst. in Checking & Inspection of Part

COURSE CODE: **MSME/CCIQC/03**

COURSE OUTCOMES:

After completion of course Student should be able to

After completion of course Student should be able to

- Understand End and line Standard
- Check linear measurements by using Vernier, Micrometer (Digital and Analog type)
- Check Linear Measurement by height gauges (Digital and Analog type).
- Check various geometrical parameters using measuring instruments
- Demonstrate angle and taper measurements by bevel protractor and Sine bar.
- Demonstrate screw thread and gear measurement.
- Use various advance instruments for linear, angular and profile measurement.
- Carry out surface roughness measurement using Surface roughness tester

THEORY HOURS: 60 **PRACTICAL HOURS: 240** **OJT HOURS-90**

THEORY MARKS:100 **PRACTICAL MARKS:100** **VIVA MARKS: 100**

Unit No.	**Unit Name**	**Unit level outcomes**	**Contents (chapters/topics)**	**TH/PR/ OJT hours**	**Marks**
UNIT-I	Introduction to basic Engineering Measurement & Metrology	After completion of unit Student should be able to • Describe and explain End and line standards. • Demonstrate the use of Slip gauges • Explain and demonstrate various gauges	Define Metrology, Accuracy and Precision, End & line standards Desirable features of end standards, and use of slip gauge	12	20
UNIT-II	Measuring Instruments: Gauges & Comparators	After completion of unit Student should be able to • Explain and demonstrate various gauges • Understand and demonstrate comparators like multi angle, sigma comparators	Gauges: GO- No GO type , Plug, Ring, tapper, thread, Snap, filler gauge etc., Comparators: Multi angle Sigma comparator, Back pressure and free flow type pneumatic comparators, Differential back pressure gauge.	12	20

UNIT-III	Measuring Instruments: Vernier , Micrometer and height Gauge	After completion of unit Student should be able to • Explain various measuring machines • Demonstrate and explain Optical dividing head • Analyze the co-ordinate systems and its applications	vernier Caliper (Digital, Analog and Dial type), micrometer (Analog and Digital type), height gauges (Digital and Analog type), Dial indicator, calculation of least count for various instruments (Vernier Caliper, Micrometer and Height Gauge), inside micrometer, depth micrometer, bevel protractor and Sine bar, Optical Flat, Sprit level , Roughness tester and profile projector	24	40
UNIT-IV	Screw Threads and Form Errors	After completion of unit Student should be able to • Evaluate straightness & flatness • Evaluate and do analysis of parameters of screw threads • Identify and understand pitch errors • Determine and describe various methods of measurements of Screw threads	Evaluation of straightness & flatness, evaluation of roundness – intrinsic & extrinsic datum. Surface Finish: stylus instrument (TALYSURF), Measurement of thread elements for internal & external threads,	12	20

UNIT-V	Coordinate metrology	At the end of this Unit the student should be able to: CMM types: Rigid body analysis of machine errors CMM usage, Software and measurement procedures, Task specific uncertainty	CMM types: Rigid body analysis of machine errors (see machine tools), CMM probes, CMM usage, Software and measurement procedures, Task specific uncertainty.	24	25
UNIT-VI	Machine tool metrology	At the end of this Unit the student should be able to: Specification of machine errors, Standard tests for machining centers and lathes, ASME B5.54, ASME B5.57 Rigid body analysis	Specification of machine errors, Standard tests for machining centers and lathes, ASME B5.54, ASME B5.57, Rigid body analysis of machine errors (see CMMs)	24	25
UNIT-VII	Surface metrology	At the end of this Unit the student should be able to: Instruments Filters Parameters Optical methods White light interferometers	Stylus methods:- Instruments Filters Parameters Optical methods White light interferometers	24	25
UNIT-VIII	Basics of gear and thread metrology	At the end of this Unit the student should be able to: Other area instruments Pitch and pitch diameter Thread angle Involute curves Pitch diameter measurement over wires Measurement of gear and thread wires	Other area instruments Pitch and pitch diameter Thread angle Involute curves Pitch diameter measurement over wires Measurement of gear and thread wires	24	25

COURSES / MODULE TEMPLATE

NOS /Module: Employability Skill

NOS /Module Code: MSME/ES/01

THEORY HOURS: 30 PRACTICAL HOURS: - THEORY MARKS: 100 PRACTICAL MARKS: -

Refer Standard Curriculum developed by NCVET. (https://nqr.gov.in/downloads/pdfs/30-hours_MC_Employability_Skills.pdf)