**CONTACT DETAILS OF THE AWARDING BODY FOR THE QUALIFICATION**

**Name and Address of Awarding Body:**

**Name and address of awarding body:**

Indo Danish Tool Room,

M4,Part 6,Tata Kandra Road,Gamharia

Jamshedpur-0657,2201261/62

**Name and contact details of individual dealing with the submission**

**Name:**

Mr. Anand Dayal

General Manager

Indo Danish Tool Room,

M4,Part 6,Tata Kandra Road,Gamharia

Jamshedpur-

**Tel number(s):** 0657,2201261/62

**E-mail address: reach@idtrjamshedpur.com,training@idtrjamshedpur.com**

**SUMMARY**

|  |
| --- |
| **Qualification Title: Advance Certificate Course in Inspection & Quality Control** |
| **Nature and Purpose of the Qualification:**  **Nature: Advance Certificate Course**  **Purpose:**  **:** Learners who attain this qualification are competent in Inspection and Quality Control and get a job in the Quality Control Inspector/ Quality Controller in Manufacturing Sector. Qualified learners who attain the above skill can also become an entrepreneur. |
| **Body/bodies which will award the Qualification:**  **Indo Danish Tool Room , Jamshedpur.** |
| **Body which will accredit providers to offer courses leading to the qualification:**  **Indo Danish Tool Room , Jamshedpur.** |
| **Body/bodies which will be responsible for assessment:**  **Indo Danish Tool Room , Jamshedpur.** |
| **Occupation(s) to which the Qualification gives access:**  Job Inspector / Quality Control Inspector in Manufacturing Sector |
| **Proposed level of the Qualification in the NSQF:**  Level-5 |
| **Anticipated volume of training /learning required to complete the Qualification:**  780 Hours |
| **Entry requirements/recommendations:**  Preferably 10+2 with Science / Graduation in any discipline  Minimum age 17 years |
| **Progression from the qualification:**  After completion of course and after 3 years of field experience the trainee can work as a QC Inspector and after 5 years of experience, the person can work as a Workshop Supervisor (QC). |
| **Planned arrangements for the Recognition of Prior Learning (RPL)**  Yes |
| **International comparability where known:**  ASM International  ASM World Headquarters; 9639 Kinsman Road; Materials Park, OH 44073-0002 [memberservicecenter@asminternational.org](mailto:memberservicecenter@asminternational.org) |
| **Date of Planned review 1.1.2019** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Title and Identification code of component** | **Mandatory/ optional** | **Estimated size (learning hours)** | **Level** |
| **Engineering Drawing** | **Mandatory** | **96** | **Level 5** |
| **Engineering Metrology** | **Mandatory** | **96** | **Level 5** |
| **Workshop Calculation** | **Mandatory** | **96** | **Level 5** |
| **Total Quality Management** | **Mandatory** | **48** | **Level 5** |
| **AutoCAD** | **Mandatory** | **48** | **Level 5** |
| **MasterCAM** | **Mandatory** | **24** | **Level 5** |
| **N.X (UNIGRAPHICS)** | **Mandatory** | **24** | **Level 5** |
| **Inspection (CMM)** | **Mandatory** | **132** | **Level 5** |
| **Employability skill** | **Mandatory** | **96** | **Level 5** |
| **Inspection & Quality Control -On Job Training** | **Mandatory** | **120** | **Level 5** |

|  |
| --- |
| **Body/Bodies which will carry out Assessment:**  A separate department / body – Training Assessment Wing of Indo Danish Tool Room, Jamshedpur. |
| **Will the Assessment Body be responsible for RPL Assessment?**  Yes, Assessment body will be responsible for RPL assessment.  Learners who have met the requirements of any Unit Standard that forms part of this qualification may apply for recognition of prior learning to the relevant Education body. The applicant must be assessed against the specific outcomes and with the assessment criteria for the relevant Unit Standards. |
| **Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF.**  **1. ASSESSMENT GUIDELINE:**   * Criteria for assessment based on each learning outcome, will be assigned marks proportionately to its importance. * The assessment for the theory & practical part is based on knowledge bank of questions created by trainers and approved by **Examination Cell of Indo Danish Tool Room , Jamshedpur.** * For each Individual batch, Examination cell will create unique question papers for theory part as well as practical for each examination. * To pass the Qualification, every trainee should score a minimum of 70% cumulatively (Theory and Practical) * Assessment comprises the following components: * Job carried out in labs/workshop * Record book/ daily diary * Answer sheet of assessment * Viva –voce * Progress chart * Attendance and punctuality   **2. ASSESSORS:**  **Indo Danish Tool Room ,Jamshedpur** faculty teaching the Advanced Programming and Operation with CAD/CAM course, also assesses the students as per guidelines set by **Examination Cell of Indo Danish Tool Room , Jamshedpur** Faculties are trained from time to time to upgrade their skills on various aspects such as conduction of assessments, teaching methodology etc.  **3. ELIGIBILITY TO APPEAR IN THE EXAM:**  Minimum 80% attendance is compulsory for the students to appear for the assessments.  **4. MARKING SCHEME:**   |  |  |  |  | | --- | --- | --- | --- | | **Sr. No.** | **Method of Assessments** | **Weightage** | **Evaluator** | | **1** | Practical test | 25 | **Trainer + Moderator (Head of Dept.)+ Examiner nominated by Examination cell (IDTR)** | | **2** | Written test(Engineering  Metrology) | 10 | | **3** | Communication/Employability  skills | 10 | | **4** | Workshop calculation | 10 | | **5** | Engineering Drawing | 10 | | **6** | Quality Management System | 10 | | **7** | Internal assessment | 25 | | **Total** | | **100** |  |   **5. PASSING MARKS:**  Passing criteria is based on marks obtained in attendance record, term works, assignments, practical performance, viva or oral exam, module test, practical exam and final exam.  Minimum Marks to pass practical exam – 60%  Minimum Marks to pass theory exam – 40%  Grade Equivalents: -  >85% Ex  >65% &<85% A  >50% &<65% B  >35% &<50% C  <35% D  **6. RESULTS AND CERTIFICATION:**  The assessment results are backed by evidences collected by assessors. Successful trainees are awarded the certificates **Indo Danish Tool Room , Jamshedpur.** |

**ASSESSMENT EVIDENCE:**

Assessment evidence comprises the following components document in the form of records:

* 1) Job carried out in labs/workshop
* 2) Record book/ daily diary
* 3) Answer sheet of assessment
* 4) Viva –voce
* 5) Progress chart
* 6) Attendance and punctuality

**Title of Component: Advance Certificate Course in Inspection & Quality Control**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Title of Component: Engineering Drawing** | | | | | |
| **LO** | **Assessment outcome description** | | **Theory** | **Practical** | **Total** |
| Describe and explain various Drawing Equipments.  Understand of engineering Dimensioning method and their apExplain and demonstrate four quadrants  Explain the projection of points – front view, top view and side Understand of Surface development of geometrical object.  State Meaning of orthographic projection  Distinguish between Isometric view and Isometric projection  Distinguish between temporary and permanent fastenings  Preparation of assembly drawing and surface finish symbol | 1. The Importance of Engineering Graphics: Explanation  of the scope and objective of Engineering Drawing – its importance as a graphic communication- need for  preparing drawing as per standards – BIS, SP 46.  2. Drawing Instruments: Basic drawing instruments –T square –Setsquare –compass -dividers –drawing boards –Pencils – Drawing papers – Mini drafter – French curves – Stencils – Selection and method of using them.  3. Drawing Standards: Size of drawing sheets – Layout of  drawing sheet – Title Blocks – Types of lines – Folding of drawing sheets.  4. Free hand Lettering and Numbering: Need for legible  lettering and numbering on drawings – selection of suitable size of lettering for different drawing, writing of Engineering drawing titles and notes using both vertical and sloping styles.  5. Dimensioning: Function of dimensioning - need for dimensioning - engineering drawing according to BIS – Notation used in dimensioning – Dimension line – Extension line – Arrow heads and leader – System of dimensions  6. Geometric Construction: Construction of regular polygon - given the length of its side, Conics- construction of ellipse, parabola and hyperbola by eccentricity method, construction of cycloid, construction of involutes of square and circle, drawing of tangents and normal to the above curves  7. Principles of Orthographic Projection: Explanation of the meaning of orthographic projection using a viewing box and a model- number of views obtained need of only three views for displaying the object - explanation of the meaning of first angle and third angle projection – symbol of Projection-Front view, top view and side view-sketching these views for a number of engineering objects. | | 46 | 44 |  |
| **Title of Component: Workshop Calculation** | | | | | |
| Geometrical construction & theorem: division of line segment, parallel lines, similar angles,  perpendicular lines, isosceles triangle and right angled triangle   Area of cut-out regular surfaces: circle and segment and sector of circle.   Volume of cut-out solids: hollow cylinders, frustum of cone, block section. Volume of simple machine  blocks.   Material weight and cost problems related to trade.   Finding the value of unknown sides and angles of a triangle by Trigonometrical method.   Finding height and distance by trigonometry.   Application of trigonometry in shop problems. (viz. taper angle calculation).   Graph: -Read images, graphs, diagrams–bar chart, pie chart. Graphs: abscissa and ordinates, graphs  of straight line, related to two sets of varying quantities. | 1. Unit: Systems of unit-FPS,CGS, MKS/SI unit, unit of  2. length,Mass and time,Conversion of units  3. Fractions: Fractions, Decimal fraction, L.C.M., H.C.F., Multiplication and Division of Fractions andDecimals, conversion of Fraction to Decimal and vice versa. Simple problems using Scientific Calculator.  4. Square Root:Square and Square Root, method of finding out square roots, Simple problem using  calculator.  5. Ratio &Proportion: Simple calculation on related problems.  6. Percentage: Introduction, Simple calculation.Changing percentage to decimal and fraction and vice-versa.  7. Algebra: Addition, Subtraction, Multiplication,  Division, Algebraic formula, Linear equations (with two  variables)  8. Mensuration: Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi-circle, Volume of solids – cube, cuboid, cylinder and Sphere.  9. Surface area of solids –cube, cuboid, cylinder and Sphere.  10. Trigonometry: Trigonometrically ratios, measurement of angles.Trigonometric tables | | 94 | - |  |
| **Title of Component: Quality Management System** | | | | | |
| Describe the basic concepts, terminology and overcome legislative framework in the subject  area of quality, quality control and quality management system   Describe ways of applying quality management in the actual organization,   Demonstrate the capability of making quality process for the selected process,   Perceiving the organization to determine the existence or nonexistence of the implemented  quality management system,   Demonstrate the capability of making quality process, given the well-known process, identify the  standard that could be applied, the roles and responsibilities of reference legislative framework   Choose the optimal approach to the analysis of a given process by describing the activities | | 1. Explain the laws, principles and phenomena in thefield  of quality management,  2. adoption of theoretical and practical knowledge and skills in the field of quality management.  3. define the basic concepts, terminology and overcome legislative framework in the subject area of quality, quality control and quality management system,  4. describe ways of applying quality management in the actual organization,  5. demonstrate the capability of making quality process for the selected process,  6. perceiving the organization to determine the existence or  7. nonexistence of the implemented quality management system,  8. demonstrate the capability of making quality process, given thewell-known process, identify the standard that could be applied,the roles and responsibilities of referencelegislative framework  9. choose the optimal approach to the analysis of a given  process by describing the activities  10. peculiarities of evolution of quality management  11. and its significance for the management of modernorganizations;  12. Analyze quality features of products andservices;  13. Principles of standardization and conformity  14. assessment;  15. Peculiarities of implementation, certification  16. and audit of quality management systems;  17. the usage of quality control methods for the  18. Analysis and solution of organizations’ problems. | 22 | 20 |  |
| **Title of Component: Engineering Metrology** | | | | | |
| Describe and explain various metrological terms like line standards, end standards , cExplain and demonstrate instruments like Slip gauges, photoelectric microscope  Explain and demonstrate various gauges like NPL gauge  Classify & describe various measuring machines like Floating carriage diameter measuriCalibrate and explain Calibration of line standards  Predict and examine various modes and types of errors and also the demonstration o  for measurement.  Evaluate and do analysis of parameters of screw threads  Determine and describe various methods of measurements of gear terminology | | After completion of  unit Student should be  able to   Describe and  explain End  and line  standards.   Explain use  and  manufacturingof Slip gauges   Demonstrate  and use of Slipgauges   Explain and  demonstrate  various  gauges   Calibrate and  explain  Calibration of  line standards After completion of  unit Student should be  able to   Understand  Taylor’s  principles of  gauge design   Explain and  demonstrate  various gauges   Understand  and  demonstrate  comparators  like multi  angle, sigma  comparators   Understand  and explain  use of LVDT  Explain  various  measuring  machines  Demonstrateand explain  Optical  dividing head  Annalise the  co-ordinate  systems andits  applications  Understand  and explain  Design  principals of  measuring  machines | 46 | 46 |  |
| **Title of Component: AutoCAD-Theory** | | | | | |
| Describe types of different CAD software.   Create 2D geometric sketches by using Auto CAD software.   Develop 3D modeling by using advanced command.   Define assembly constraint & develop different types of assembly design by  using AutoCAD Software.   Describe design generative & interactive drafting. | | At the end of this Unit the studshould be able to:   CAD/CAM software.   various feature in CAD  software.   various types of CAD  software.   Uses and Importance o  CAD software in Industri Selection criteria of CA  software.   Drawing curve object.   Create various types o  sketch geometry.   Editing property tools. Controlling drawing  display.   Geometric dimension &  tolerance method  Working with block &  defining block attributes.   Concept of Isometric  Drawing, Layout & Plotting.   Execute of solid modeling /  3d modeling.   Create surface modeling. Capability of AutoCAD.  2D drawing generation  with dimensioning &  detailing.  Create and Modification oSurface Entities Trimmingand Lofting of Surfaces,  Surface Diagnostics,  Reflection Line Analysis.  Create Solid Modeling andFeature Based Part  Modeling.  Assembly- Constraint  based Parametric Profile  Editing and 3D Constraint  Solver. | 16 | 26 |  |
| **Title of Component: Master CAM** | | | | | |
| Capabilities of CAM Software like Master CAM.  Create 2D geometric sketches by using Master CAM.  3D solid & surface terminology. | | Capabilities of CAM Software like Master CAM.  Scope of software.  Difference between CAM/CAD software.  Analyze various CAM software compare to Master CAM.  2D drawing.  Create basic geometry.  Execute editing, modification, creating features.  Brief Transformation feature.  Understand modify tool.  Picking Dimension. | 5 | 16 |  |
| **Title of Component: NX (Unigraphics)** | | | | | |
| Understand software UG as compare to other CAD software.  Create 2D geometric sketches, Dimension by using UG software.  Understand design generative & interactive drafting.  Apply knowledge in create complicated modeling & creative/innovative solution. | | Capability of CAD Software.  Introduction to NX (Unigraphics)  Criteria for selection of CAD workstations, Geometric modeling, entities, 2D & 3D Primitives. Different Types of cad software. Also comparison of various CAD Software.  CAD software features.  Technical terms related to NX  (Unigraphics).  Drawing sketches for solid models.  Creating sketches in the Sketch task  environment & Modeling  Environment.  Various Sketching Tool.  Editing, Extruding, Revolving sketches.  Adding Geometric & Dimensional  Constraint to sketches. | 6 | 16 |  |
| **Title of Component: INSPECTION (CMM) -Theory** | | | | | |
| Understand CMM.  2D geometric, Dimension by using CMM.  Understand design generative & interactive drafting. | | CMM types: Rigid body analysis of  machine errors (see machine tools),  CMM probes, CMM usage, Software  and measurement procedures, Task  specific uncertainty.  Specification of machine errors,  Standard tests for machining  centers and lathes, ASME B5.54,  ASME B5.57, Rigid body analysis ofmachine errors (see CMMs)  Stylus methods:- Instruments  Filters  Parameters  Optical methods  White light interferometers  Other area instruments  a. Pitch and pitch diameter  b. Thread angle  c. Involute curves  d. Pitch diameter measurement over  wires  e. Measurement of gear and thread  wires | 30 | 96 |  |
| **Title of Component: Employability Skill-Theory** | | | | | |
| Interact effectively with co-workers and customers.  Make persons excellent workers and suitable to work in a team.  Develop Resumes or curriculum vita.  Operated computer with MS office tool  Access internet and web browsing.  Personal safety and work ethics.  Overcome communication barriers. | | Reading and understanding simple sentences about self, work and  Environment.  Construction of simple sentences  Writing simple English. Develop  Resumes or curriculum vita.  Letters of application reference to previous communication.  Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain  confidence through role-playing  and discussions on current  happening job description, asking about someone’s job habitual  actions.  Introduction, Computer and its  applications, Hardware and  peripherals, Switching on-Startiand shutting  down of computer Basic operating of Word  Processing, Creating, opening and closing Documents, use of  shortcuts, Creating and Editing of Text, Formatting the Text,  Insertion & creation of Tables.  Printing document.  Basics of Excel worksheet,  understanding basic commands,  creating simple worksheets,  understanding sample worksheets, use of simple formulas and  functions, Printing of simple excelsheets  Characteristics Essential to  Achieving Success  The Power of Positive Attitude  Self awareness  Importance of Commitment  Ethics and Values  Ways to Motivate Oneself  Personal Goal setting and  Employability Planning  Problem Solving  Introduction to Occupational Safety and  Health importance of safety and  health at workplace  Basic Hazards, Chemical Hazards,  Vibroacoustic Hazards, Mechanical  Hazards, Electrical Hazards,  Thermal Hazards.  Occupational health, Occupational  hygienic, Occupational Diseases/  Disorders & its prevention  Basic principles for protective  equipment.  Accident Prevention techniques –  control of accidents and safety  measures. | 70 | 22 |  |
| **Title of Component: Employability Skill** | | | | | |
| Explain applications and advantages of Inspection & Quality Control and technology  Demonstrate and explain various Inspection & Quality Control Calculate technological data for  Inspection   Prepare line program for various profiles Identify and set parameters for CMM   Prepare programs , demonstrate , simulate and operate CMM machines   Define and explain Modern CMM systems and explain its importance in manufacturing. | | Introduction to Inspection &  Quality Control.  History & development of  Inspection & Quality Control.  Conventional Vs. non-conventional  machine tool.  Numerical control on CMM  machine tools CMM control and  Calculation of technological data  for CMM machining.  CMM clamping system.  Implementation of JH for CMM  Basic health and safety  Application Numerical Control,  Advantages, & Disadvantages,  Adoptive Control System.  Practical training & workshop for  above sub topics on CMM  Machine. | 70 | 20 |  |
| **On Job Training** | |  |  | 120 |  |

**EVIDENCE OF RECOGNITION AND PROGRESSION**

|  |
| --- |
| **What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?**  Relevant information was collected from Industries and allied sector working in this area.  The Automotive Components industries are recruiting people based on the qualification acquired. Maximum of the industries accept this as qualification for selection/short listing of the individual approved by members.  **Vertical Pathway:**  The Occupational Map has been created & attached.  The Job Inspector / Quality Control Inspector in Manufacturing Sector has a clear pathway  **Horizontal Pathway:**  The individual can migrate within the Automotive Components related industries. |