**Inspection & Quality Control**

* Course Id : **MSME/IQC**
* Candidate Eligibility : **Inter / ITI passed or its equivalent.**
* No. Of NOS (If QP) : **4**
* NSQF Level : **4**
* Cost Category : **2**
* Course Duration
  + Theory duration : **192**
  + Practical duration : **288**
  + OJT duration : **120**

**Trainer Qualification Work Experience**

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| **Trainer Qualification** | **Work Experience** |
| * Minimum - Diploma/Degree in Mechanical Engineering * Certified for Job Role: “Diploma/Degree” with Minimum acceptance score of 60 % * Recommended that the Trainer is certified for the Job Role: “Diploma/Degree” with Minimum accepted score of 60%. * Alternatively, must have successfully undergone a CGSC organized TOT workshop on “How to Trainer”. | * Minimum 3 to 4 years of industry experience in relevant job role and a Minimum of 3 to 4 years and Training experience in relevant job role. |

**CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE**

**Name and address of submitting body:**

**Tool Room & Training Centre, Patna**

**(An Extension Centre of Indo-Danish Tool Room, Jamshedpur)**

**Ministry of MSME, Govt. of India**

**Patliputra Industrial Estate**

**Patna-800013**

**(0612) 2270744**

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

**Name : Shri. Ashutosh Kumar**

**Position in the organisation : General Manager (I/c)**

**Tel number(s) : (0612) 2270744**

**Mobile : 7260801191**

**E-mail address : trtcpatna14@gmail.com**

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| --- | --- |
| **Qualification Title** | **Inspection & Quality Control** |
| **Qualification Code** | **MSME/IQC** |
| **Nature and purpose of the qualification** | **Nature: A general qualification offered in a formal educational context.**  **Purpose: To get unemployed people into work.** |
| **Body/bodies which will award the qualification** | **Tool Room & Training Centre, Patna**  **(Certificate Awarded by TRTC, Patna)** |
| **Body which will accredit providers to offer courses leading to the qualification** | **Tool Room & Training Centre, Patna**  **(Certificate Awarded by TRTC, Patna)** |
| **Body/bodies which will carry out assessment of learners** | **Examination Cell of Tool Room & Training Centre, Patna** |
| **Occupation(s) to which the qualification gives access** | **Quality control inspectors** |
| **Licensing requirements** | **Not Applicable** |
| **Level of the qualification in the NSQF** | **Level 4** |
| **Anticipated volume of training/learning required to complete the qualification** | **600** |
| **Entry requirements and / or recommendations** | **Inter / ITI passed or its equivalent.**  **Age 15 years to 35 years** |
| **Progression from the qualification** | **Job Progression:**  **After completion of course and after 3 years of field experience the trainee can work as a Assistant Quality control inspectors and after 5 years of experience, the person can work as a supervisor Quality control inspectors .** |
| **Planned arrangements for the Recognition of Prior learning (RPL)** | **Yes** |
| **International comparability where known** | **Existence of any official document suggesting the comparability of the qualification with the qualifications in other countries is not known.** |
| **Date of planned review of the qualification.** | **January 2020** |

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| **Formal structure of the qualification** | | | | | |
| **Title of component and identification code** | **Mandatory/ Optional** | **Estimated size (learning hours)** | **Theory hours** | **Practical hours** | **Level** |
| **1. Engineering Drawing** | **Mandatory** | **72** | **24** | **48** | **4** |
| **2. Engineering Metrology** | **Mandatory** | **72** | **24** | **48** | **4** |
| **3. Workshop Calculation** | **Mandatory** | **48** | **48** | **-** | **4** |
| **4. Total Quality Management** | **Mandatory** | **48** | **24** | **24** | **4** |
| **5. AutoCAD** | **Mandatory** | **48** | **-** | **48** | **4** |
| **6. MasterCAM** | **Mandatory** | **24** | **12** | **12** | **4** |
| **7. N.X (UNIGRAPHICS)** | **Mandatory** | **24** | **12** | **12** | **4** |
| **8. Inspection (CMM)** | **Mandatory** | **144** | **48** | **96** | **4** |
| **9. On Job Training** | **Mandatory** | **120** | **-** | **120** | **4** |
| **Total** | |  | **192** | **408** |  |

**ASSESSMENT**

**Body/Bodies which will carry out assessment:**

Examination cell - *Tool Room & Training Centre, Patna*

**How will RPL assessment be managed and who will carry it out?**

*YES. 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, reliable 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 outcomes, will be assigned marks proportional 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 (TRTC, Patna)

- For each Individual batch, Examination cell will create unique question papers for theory part as well as practical for each candidate at each examination.

- To pass the Qualification, every trainee should score a minimum of 40% in each Theory and 50% in each Practical subject.

- 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:**

TRTC Patna faculty teaching the Advanced Programming and Operation with CAD/CAM course, also assesses the students as per guidelines set by Examination cell of TRTC. 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 70% attendance is compulsory for the students to appear for the assessments.

**4. MARKING SCHEME:**

**Semester-I**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Method of Assessments** | **Weightage** | **Evaluator** |
| **1** | Practical test | 25 | **Trainer + Moderator (Head of Dept)+ Examiner nominated by Examination cell (TRTC)** |
| **2** | Written test (Trade Theory) | 15 |
| **3** | Communication/Employability skills | 10 |
| **4** | Workshop calculation & Metrology | 10 |
| **5** | Engineering Drawing | 15 |
| **6** | Internal assessment | 25 |
| **Total** | | **100** |  |

**5. PASSING MARKS:**

Passing criteria is based on marks obtain in attendance record, term works , assignments, practical’s performance, viva or oral exam, module test, class 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 by TRTC, Patna.

**ASSESSMENT EVIDENCE**

ASSESSMENT EVIDENCE

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

Job carried out in labs/workshop

Record book/ daily diary

Answer sheet of assessment

Viva –voce

Progress chart

Attendance and punctuality

|  |  |  |
| --- | --- | --- |
| **Title of Component** | | **Inspection & Quality Control** |
| **Sr.no** | **Outcomes to be assessed** | **Assessment criteria for the outcome** |
| 1 | Follow work ethics and identify necessary Quality and Inspection | 1. Competent to understand the requirement and physically fit to carry out the work 2. Ensuring appropriate tools are in working condition and available 3. Prohibiting consumption of alcohol and tobacco in any form, at workplace 4. Behave respectfully with co-workers and use appropriate language for inter-personal communication. 5. Use public conveniences (toilets) only. |
| 2 | Perform task with due consideration to safety rules in coordination with team and following government regulations | 1. Check for all the personal protection equipments before entering into the workplace 2. Conduct appropriate discussions within the team 3. Be aware of the working environment and promptly act during emergencies. 4. Present facts and situations and use appropriate inspection for work and safety. 5. Helping the co-workers at the time of need at workplace 6. Maintaining good working relationship |
| 3 | Apply professional knowledge & technical knowledge while performing the task | 1. Understand the importance of Inspection and Quality Control. 2. Displaying skills of Inspection, CAM and CMM. 3. Taking decisions at the workplace with due recognition and understanding of government set norms. 4. Showcasing sensitivity towards the precision machines and conventional machines and their maintenance. |
| 4 | Should be able to work effectively in team to deliver desired results at workplace | 1. Gather a team 2. Divide work amongst the team members |
| 5 | Maintain regularity at the workplace. | 1. Maintaining regularity at the workplace 2. Maintaining decorum of the workplace 3. Open to learning and engaged in discussions 4. Execute the assigned task with in time frame |
| 6 | Able to work observing personal health, safety & environmental protocol at Workshop | 1. Know how of safety precautions 2. Know how to give first aid 3. Should know do’s and don’t’s on the work site 4. Should know about personal protection equipment |
| **Specific assessable outcome** | | |
| [**S. no**](http://S.no) | **Assessable outcomes** | **Assessment criteria** |
| 1 | CAM Capability | 1. Displaying skills for reading and interpreting information that can be extracted from drawings, specifications, schedule and method statements. 2. Demonstrating skills while cleaning surfaces, measuring, assembling, dismantling, cleaning. 3. Apply safe work practices, follow procedures, report problems and rectify them 4. Minimise damage and maintain clean work place 5. Use appropriate tools and equipments 6. Exercising safe practices while machine handling by wearing gloves. 7. Uses personal protective equipments and access equipment safety to carry out the activity in accordance with legislation and organisational requirement. |
| 2 | CMM Capability | 1. Displaying skills for reading and interpreting information that can be extracted from drawings, specifications, schedule and method statements. 2. Demonstrating skills while cleaning surfaces, measuring, assembling, dismantling, cleaning. 3. Apply safe work practices, follow procedures, report problems and rectify them. 4. Minimise damage and maintain clean work place 5. Use appropriate tools and equipments 6. Exercising safe practices while machine handling by wearing gloves. 7. Uses personal protective equipments and access equipment safety to carry out the activity in accordance with legislation and organisational requirement. |
|  | **Means of assessment**  Skill performance is assessed by conducting  i) Assignment for each semester  ii) Written test for each semester  iii) Final exam after completion of both the semesters  iv) Practical exam for each semester  v) Final practical exam after completion of both the semesters  vi) Viva / Oral Exam | |
|  | **Pass/Fail**  Passing criteria is based on marks obtain in attendance record, term works , assignments, practical’s performance, viva or oral exam, module test, practical exam and final exam  i) Minimum Marks to pass practical exam – 60%  ii)Minimum Marks to pass theory exam – 40% | |

**Course Curriculum**

**Syllabus content with time structure**

**For the course of Inspection & Quality Control**

**Duration: 600 hrs.**

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| **Session Name: Engineering Drawing** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (24 hours)** | **Activity (48 hours)** |  | **Practical** | **Theory** |
| **Engineering drawing as a graphical language used by engineers, users and technicians** |  | **State the importance** and objectives of engineering drawing.  State the standards used for drawing. | 24 | 48 |
| **Drawing equipments** |  | **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. |  |  |
| **Dimensioning Techniques** |  | **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.  Use co-ordinate dimensioning, methods of dimensioning Diameter, Radii, Chords, angles. |  |  |
| **Recognize the points in various quadrants** |  | 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). |  |  |
|  | **Orthographic projection of machine parts** | **State Meaning** of orthographic projection  Draw elevation, plan and side elevation of the machine parts like stepped block, fork lever, bearing block, etc. |  |  |
|  | **Isometric projection and views of solids 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 isometric view |  |  |
|  | **Preparation of assembly drawing** | hinge  C-clamp  Drill base and table  Tool makers clamp  Drill jig  Plumber block, etc. |  |  |
| **Surface finish symbols** |  | **Indication**  Special surface  Direction of lay  Machining allowance  Position of symbol  Symbols with inscriptions  Additional indications |  |  |
|  | **Fits and**  **Tolerance** | Indications in assembly drawings |  |  |

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| **Session Name: Engineering Metrology** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (24 hours)** | **Activity (24 hours)** |  | **Practical** | **Theory** |
| **Metrology** |  | **Introduction**  Definition of measurement  Aims of measurement  Standards of measurements – primary and electric standards.  Methods of measurement – direct and indirect comparison.  Precision and accuracy  Sensitivity and repeatability  Errors in measurements  Systematic error  Calibration procedure in measuring instruments. | 48 | 24 |
|  | **Measuring Instruments, Principle, Construction Least Count + Uses** | **Precision instruments**  Linear measurements  Non precision, steel rule, calipers dividers, telescopic gauges, Depth gauge.  Micrometers, vernier calipers  Height gauges  Slip gauges  Comparators |  |  |
|  | **Angular Measurements**  **Non Precision** | **Protractors**  Adjustable bevel  Engineers square  Combination set |  |  |
|  | **Precision Angle Measurement** | **Bevel protection,** dividing head sine bar, angle gauges, spirit level clinometers, Auto collimators. |  |  |
|  | **Limits, Tolerances And Fits** | **Definition – Inter** changeability  Basic size – Actual size  Limits of size  Maximum limit of size  Minimum limit of size  Hole  Shaft  Deviation  Upper deviation  Lower deviation  Actual deviation  Tolerance  Zero line  Fundamental deviation  Fundamental tolerance  Toleranced size |  |  |
|  | **Fits And Their Classification** | **Definition of a fit expression** 30H7/g6  Clearance  Clearance fit  Maximum clearance  Minimum clearance  Interference fit  Maximum interference  Minimum interference  Transition fit  Hole basis system  Shaft basis system |  |  |
|  | **Gauges** | **Types of gauges**  Plain gauges  Plug gauges  Snap gauges  Ring gauge  Adjustable type  Gap gauge  Combined limit gauges  Position gauge  Taylor’s principle of gauge design |  |  |
|  | **Comparators** | **Introduction**  Purpose of comparators  Types of comparators  Read type mechanical comparators – Dial indicators, advantages and disadvantages.  Working principle of pneumatic comparator and solex air gauge.  Optical comparators |  |  |

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| **Session Name: Workshop Calculation** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (48 hours)** | **Activity (0 hours)** |  | **Practical** | **Theory** |
| **Trigonometry units and measurement of angles** |  | **To define right angle in** different systems and a radian.  Relation between Radians and Degrees – Problems.  To derive Arc length = r x 0 and Area of a sector A = ½ r20 and to show radian is a constant angle – Related Problems. | 0 | 48 |
| **Trigonometric ratios** |  | **Definition of Trigonometric** functions as sides of a right angled triangle.  To derive Identities – Problems  To find Trigonometric Ratios of Standard angles like 00, 300, etc., |  |  |
| **Allied angles** |  | **Rule of signs**  Meaning of Allied angles and Derivations of -0, 90, -0, 90 + 0.  Formulae of 180 ± 0, 270 ± 0, 360 ± 0, etc. using the formulae of 90±0 |  |  |
| **Mensuration** |  | **Problems based on Allied** angle  Problems on Areas and Volumes & other measurements. |  |  |
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| **Heights and distances** |  | **Definition of angle of** elevation and depression  Illustration to find heights and distances of objects  Problems  To write Sin(A-B), Cost(AA\_B) and tan(A-B) by replacing B by –B.  To derive ratios of multiple angles like 2A and 3A – Problems  To writer half angle formulae from ratios of 2A formulae Problems. |  |  |

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| **Session Name: Total Quality Management** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (24 hours)** | **Activity (24 hours)** |  | **Practical** | **Theory** |
| Introduction |  | **Introduction:** Importance of quality in the management of company. Concepts of quality management. Quality dimensions of goods and services. Quality management evolution and works of quality gurus. | 24 | 24 |
| Quality policy and quality organizations |  | **Quality policy and quality organizations:** International and Indian quality organizations. Indian quality policy. International, regional and national standardization. System of assessment of quality conformity in Indian. |  |  |
|  | Management systems and quality management principles for excellence | **Management systems and quality management principles for excellence:** Quality management systems. Quality control methods. Quality audit and certification of management systems. Sustainable development. Environment management systems. Occupational health and safety management system. Eco-labelling. Total quality management. |  |  |
|  | Total quality management  TQM PRINCIPLES | **TQM PRINCIPLES:** Customer satisfaction - Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement - Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal.  **TQM TOOLS :** Benchmarking - Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) - House of Quality, Total Productive Maintenance (TPM) - Concept, Improvement Needs.  KAIZEN, Quality Circles, Quality Models for organizational excellence.  7 QC tools, 7 New Quality Management Tools. |  |  |
|  | Quality System | **QUALITY SYSTEMS:** Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System - Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 - Concept, Requirements and Benefits. |  |  |

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| **Session Name: AutoCAD** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (0 hours)** | **Activity (40 hours)** |  | **Practical** | **Theory** |
|  | **AutoCAD** | 1. Introduction to computer. 2. System requirements for AutoCAD. 3. Graphics Screen of AutoCAD. 4. Menu Area Setup for drawing. 5. Creation of 2D Drawings: - Point, Line, construction line, multiline, polyline, ray, arcs, circle, rectangle, polygons, ellipse, spline, etc. 6. Modification 2D Drawing: - Fillet, chamfer, trim, mirror, scaling, stretch, copy, move, offset, array, lengthen, extend, break, join, etc. 7. Assigning of different line type to objects: - Dashed line, hidden line, center-line, dotted line, border line, gas line, tracks, zig zag, etc. 8. Transparent Overlay (Layer). 9. Tables, Text, Hatching, Gradient. 10. Block, W Block, Design Center. 11. Modeling 3D Objects: - with the help of box, cylinder, sphere, cone, torus, wedge, extrude, revolve, slice, section, interference, etc. | 48 | 0 |
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| **Session Name: MasterCAM** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (12 hours)** | **Activity (12 hours)** |  | **Practical** | **Theory** |
| **MasterCAM** |  | Introduction & Master cam interface  Concept of construction plane  General selection plane  General selection method | 12 | 12 |
|  | **Modeling & Measurement** | Creation of line, Arc, circle rectangles etc. Measurement Geometry.  Analyzing the geometry  Modifying geometry: fillet, trim, offset etc.  Introduction to 2d tool-path: contour, pocket, drill, NC parameters, generating tool paths,3d wire frame.  Tool planes, non Associative tool path parameter |  |  |

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| **Session Name: NX (Unigraphics)** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (12 hours)** | **Activity (12 hours)** |  | **Practical** | **Theory** |
| **NX (Unigraphics)** |  | **1. Introduction + Sketcher**  Intro, road map of NX, File & view management, Concept of Planes and co-ordinate systems, Sketch tools (like Curve, Constraints and Operations). & Practice, Remains Sketch tools and Practice of different 2D Profiles & Practice, Practice of different 2D Profiles and Introduction of simple 3D objects. & Practice. | 12 | 12 |
|  | **Solid Modeling** | Concept of 3D model creation, Basic From Feature tools (like Extrude, Revolve. |  |  |
|  | **Drafting** | Introduction of drafting, Creation of various views like Base view, Projected view, Detail view, Section view, Half section view |  |  |

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| **Session Name: Inspection (CMM)** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (48 hours)** | **Activity (96 hours)** |  | **Practical** | **Theory** |
| Coordinate metrology |  | CMM types: Rigid body analysis of machine errors (see machine tools), CMM probes, CMM usage, Software and measurement procedures, Task specific uncertainty. | 96 | 48 |
| Machine tool metrology |  | 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 |  |  |
|  | Surface metrology | Stylus methods:- Instruments  Filters  Parameters  Optical methods  White light interferometers  Other area instruments |  |  |
|  | Basics of gear and thread metrology | a. Pitch and pitch diameter  b. Thread angle  c. Involute curves  d. Pitch diameter measurement over wires  e. Measurement of gear and thread wires |  |  |

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| **Session Name: On Job Training** | | | | |
| **Practical competencies**  **(includes demonstration and activity)** | | **Underpinning Knowledge** | Duration (in hours) | |
| **Demonstration (0 hours)** | **Activity (120 hours)** |  | **Practical** | **Theory** |
|  | **On Job Training** | Inspection and Quality Control.  Precision instruments  Linear measurements  Non precision, steel rule, calipers dividers, telescopic gauges, Depth gauge.  Micrometers, vernier calipers  Height gauges  Slip gauges  Comparators, CMM | **120** | **0** |

**External assessments**

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| --- | --- | --- | --- |
| **Comp. NO.** | **ASSESSABLE OUTCOME** | | **ASSESSMENT RESULT** |
| **GENERIC** | | | |
| 1 | | Follow work ethics and identify necessary materials and tools | 5 |
| 2 | | Perform task with due consideration to safety rules in coordination with team and following government regulations | 5 |
| 3 | | Apply professional knowledge & technical knowledge while performing the task | 5 |
| 4 | | Should be able to work effectively in team to deliver desired results at workplace | 5 |
| 5 | | Maintain regularity at the workplace. | 5 |
| 6 | | Able to work observing personal health, safety & environmental protocol at Workshop | 5 |
| SPECIFIC | | | |
| 1 | | Precision Measuring Capability | 35 |
| 2 | | CAD/MasterCAM/NX Capability | 35 |
|  | | **External Assessment Result** | **100** |

**EXAMINATION**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl.No.** | **COURSE CODE** | **COURSE NAME** | **Examination Scheme** | | | | | | | | **Total Marks** |
| **Theory** | | | | **Practice** | | | |
| **Sessional** | | **Semester Exam** | | **Sessional** | | **Semester Exam** | |
| **Max. Marks** | **Min. to Pass** | **Max. Marks** | **Min. to Pass** | **Max. Marks** | **Min. to Pass** | **Max. Marks** | **Min. to Pass** |
| 1. | IQC -01 | Engineering Drawing-Theory | 10 | 4 | 30 | 12 | - | - | - | - | 40 |
| 2. | IQC -02 | Engineering Drawing-Practical | - | - | - | - | 20 | 12 | 40 | 24 | 60 |
| 3. | IQC -03 | Engineering Metrology -Theory | 10 | 4 | 30 | 12 | - | - | - | - | 40 |
| 4. | IQC -04 | Engineering Metrology - Practical | - | - | - | - | 20 | 12 | 40 | 24 | 60 |
| 5. | IQC -05 | Workshop Calculation | 40 | 16 | 60 | 24 | - | - | - | - | 100 |
| 6. | IQC -06 | Total Quality Management-Theory | 10 | 4 | 30 | 12 | - | - | - | - | 40 |
| 7. | IQC -07 | Total Quality Management-Practical | - | - | - | - | 20 | 12 | 40 | 24 | 60 |
| 8. | IQC -08 | AutoCAD | - | - | - | - | 40 | 24 | 60 | 36 | 100 |
| 9. | IQC -09 | MasterCAM-Theory | 10 | 4 | 30 | 12 | - | - | - | - | 40 |
| 10. | IQC -10 | MasterCAM-Practical | - | - | - | - | 20 | 12 | 40 | 24 | 60 |
| 11. | IQC -11 | N.X -Theory | 10 | 4 | 30 | 12 | - | - | - | - | 40 |
| 12. | IQC -12 | N.X - Practical | - | - | - | - | 20 | 12 | 40 | 24 | 60 |
| 13. | IQC -13 | Inspection (CMM) -Theory | 10 | 4 | 30 | 12 | - | - | - | - | 40 |
| 14. | IQC -14 | Inspection (CMM) - Practical | - | - | - | - | 20 | 12 | 40 | 24 | 60 |
| 15. | IQC -15 | On Job Training | - | - | - | - | 40 | 24 | 60 | 36 | 100 |

**Evidence of level**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LEVEL** | **Process required** | **Professional knowledge** | **Professional skill** | **Core skill** | **Responsibility** |
| 4 | Work in familiar, predictable, routine, situation of clear choice. | Factual knowledge of field of knowledge or study. | Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts. | Language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social political and natural environment. | Responsibility for own work and learning. |
| Level-4 | Level-4 | Level-4 | Level-4 | Level-4 |