**DACUM Chart for MECHANICAL PRODUCTION TECHNICIAN Level 5**

|  |  |
| --- | --- |
| **DUTIES** |  **TASKS** |
| **BASIC COMPETENCIES** |
| **A****DEMONSTRATE COMMUNICATION SKILLS** | A1Meet communication needs of clients and colleagues | A2Contribute to development of communication strategies | A3Conduct interviews | A4Facilitate group discussion | A5Represent the organization |  |  |
| **B****DEMONSTRATE DIGITAL LITERACY** | B1 Identify computer software and hardware | B2Apply security measures to data, hardware, software in automat environment  | B3Apply computer software in solving basic tasks | B4Apply internet and email in communication at workplace | B5Apply Desktop publishing in official assignments | B6Prepare presentation packages |  |
| **C****DEMONSTRATE ENTREPRENEURIAL SKILLS** | C1Develop business innovation strategies | C2Develop new product/markets | C3Expand customers and product lines | C4Motivate staff/workers | C4Expand employed capital base | C6Undertake county/regional business |  |
| **D****DEMONSTRATE EMPLOYABILITY SKILLS** | D1Develop self-awareness and understanding of every day demands and challenges in the workplace | D2Demonstrate critical safe work habits for employees in the workplace | D3Lead a workplace team  | D4Plan and organize work  | D5Maintain professional growth and development in the workplace | D6Demonstrate learning, creativity and innovativeness in the workplace |  |
| **E****DEMONSTRATE ENVIRONMENTAL LITERACY** | E1Control environmental hazard  | E2Control environmental Pollution  | E3Demonstrate sustainable resource use | E4 Evaluate current practices in relation to resource use | E5Identify environmental legislations/conventions for environmental concerns | E6Implement specific environmental programs | E7Monitor activities on environmental protection/programs |
|  | E8 Analyze resource use | E9Develop resource Conservation plans |  |  |  |  |  |
| **F****DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES** | F1Identify workplace hazards and risk | F2Implement control measures to hazards and risks | F3Implement OSH programs, procedures and policies/ guidelines |  |  |  |  |
| **COMMON COMPETENCIES** |
| **A**INTERPRET TECHNICAL DRAWINGS | A1Use drawing instrument, and materials | A2Interpret plane geometry drawings | A3Interpret solid geometry drawings | A4Interpret orthographic and pictorial drawings | A5Produce assembly drawings | A6Perform Computer Aided Drafting |  |
| **B** **USE COMMON METALLIC AND NON-METALLIC MATERIALS** | B1Identify properties of engineering materials | B2Identify ore extraction processes of metallic materials | B3Identify methods of producing engineering materials | B4Perform heat treatment | B5 Prevent material corrosion |  |  |
| **C****PERFORM BENCH WORK OPERATIONS** | C1Observe safety rules and regulations | C2Plan work operations | C3Mark out dimensions on work pieces | C4 Set up work pieces on holding devices  | C5Use hand tools  | C6Use power tools, machines and equipment  | C7Assemble metal parts and sub-assemblies |
|  | C8Inspect finished work  | C9Maintain hand tools and equipment | C10Perform housekeeping  | C11Prepare job reports |  |  |  |
| **D****APPLY ENGINEERING MATHEMATICS** | D1Apply algebra | D2Apply co-ordinate geometry | D3Apply trigonometric functions | D4Carry out mensuration | D5Apply statistics | D6Apply matrices | D7Apply vectors |
| **E****APPLY MECHANICAL SCIENCE PRINCIPLES** | E1Determine forces in a system | E2Demonstrate understanding of moments of forces | E3Demonstrate understanding of friction  | E4Demonstrate motion concepts in engineering | E5Apply concepts of work, energy and power | E6Perform machine calculations | E7Demonstrate understanding of gas principles |
|  | E8Apply concepts of heat  | E9Apply density principles | E10Apply pressure principles |  |  |  |  |
| **F** **APPLY ELECTRICAL SCIENCE PRINCIPLES** | F1 Apply basic concept of electrical quantities | F2Use the concepts of D.C and A.C circuits in electrical installation | F3 Use basic electrical machines | F4Perform earthing in Electrical installations | F5Apply lightening protection measures |  |  |
| **CORE COMPETENCIES** |
| **A****FABRICATE SHEEET METAL PARTS** | A1 Observe safety rules and regulations  | A2 Use sheet metal machines, tools and equipment  | A3Plan work operation | A4Mark out work pieces  | A5Set- up sheet metal machine and equipment | A6 Fabricate sheet metal component(s) according to specifications | A7Assess quality of fabricated component(s) |
|  | A8Maintain sheet metal machines, tools and equipment |  A9Perform housekeeping | A10Prepare job reports |  |  |  |  |
| **B****PERFORM GRINDING OPERATIONS** | B1Observe rules and regulations  | B2Identify machine parts, accessories and their functions  | B3Identify types of grinding wheels | B4Prepare work operation plan | B5Set up the grinding machine | B6Perform grinding operations  | B7 Assess quality of finished work |
|  | B8Maintain the grinding machine | B9 Perform Housekeeping  | B10Prepare job report |  |  |  |  |
| **C** **PRODUCE PARTS ON THE LATHE MACHINE** | C1 Observe safety rules and regulations | C2 Identify machine parts, tools, accessories and their functions | C3 Prepare operations plan | C4 Mount work piece | C5 Perform machining to specifications | C6 Assess quality of finished work | C7 Maintain machine tool and accessories |
|  | C 8Perform house keeping | C8Prepare job report |  |  |  |  |  |
| **D** **PRODUCE COMPONENTS ON A MILLING MACHINE** | D1 Observe safety rules and regulations  | D2 Identify machine parts, tools, accessories and their functions | D3 Plan work operations | D4 Mark out work piece  | D5 Set up milling machine tool for a specific operation | D6 Perform machining to specifications | D7 Assess quality of finished work |
|  | D8 Maintain machine tool and accessories | D9 Perform housekeeping  | D10Prepare job report |  |  |  |  |

|  |  |
| --- | --- |
| **General knowledge and skills** | **Worker Behaviour** |
| **Knowledge on*** Occupational Health and Safety Act of Kenya laws 2007 with focus on personal safety, machine safety and workplace
* National Environment Management Authority Act, Kenya 2004
* Equipment manuals
* Basic technical drawing complying to ISO, ANSI & BS standards
* ISO 1101 Geometrical tolerance and where to use the norm
* Work Planning and documentation
* Measuring tools
* Hand tools
* Bench work
* Portable and bench drilling machines
* Inspection and quality control
* Preventive maintenance of machine tools
* Metal cutting technology
* Materials and metallurgy
* WIBA act (2007)
* Report writing
* Sheet metal development
* Transmission systems
* Joining methods (bolts, screws, rivets, seams, soldering, brazing and welding [gas and MMAW welding])
* Cutting, bending, and rolling machines
* Drilling, and punching machines,drills and punches
* Use of the Guillotine, bending and rolling machines
* Production of holes in sheet metal
* Safety practices and procedures
* Fasteners
* Joining methods and techniques
* Methods of marking out
* Procedure for safe disposal of waste materials

**Skills in*** Communication skills
* Problem solving
* Data collection and analysis
* Use of tools and equipment
* Basics on mechanical maintenance
* Use of test and measuring instruments
* Organisation
* Interpreting and following information on written job instructions, manufacturer specifications, standard operating procedures, charts, lists, reports and other applicable reference documents
* Interpreting layout drawings and specifications
* Checking and clarifying information
* Reporting – oral/written
* Planning and sequencing tasks
* Measuring to specified tolerances
* Performing numerical operations, geometry and engineering calculations/formulae within unit's scope
* Creativity and innovation
* Use of tools and equipment
* Technical drawing
* Installation and fabrication
* Welding
* Material testing
* Weld inspection
* Weld positions
* Non-destructive testing (NDT)
* Destructive testing (DT)
* Sheet metal development
* Soldering
* Seaming
* Riveting
* Bolting
* brazing
* Use of the Guillotine, bending and rolling machines
* Use of hand tools to cut, fold and form sheet metal
* Production of holes in sheet metal
* Using portable and bench drilling machines
 | * Attentive to detail
* Focused
* Integrity
* Honesty
* Assertive
* Team player
* Creativity
* Time conscious
* Self-motivated
* Work ethics
* Accountability
 |
| **Future Trends and Concerns:** |
| **Future trends*** Technological advances
* Self-training
* Automation of systems
* Vision 2030
* Robot technology
* Cloud computing
* Mobile computing

**Concerns** * Self-training
* Environmental concerns
* Safety and health concerns
* Disposal concerns
* Technological advances
* Artificial intelligence
 |