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| Title | **Perform grinding machine operations** | | |
| Level | **3** | **Credits** | **21** |

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| Purpose | This competency standard identifies the competencies you need to perform grinding machine operations in accordance with approved procedures. You will be expected to perform different types of grinding which include off-hand, surface, universal cylindrical and tool and cutter grinding. You will be required to operate the grinding machine safely by complying the organizational safety policy and approved procedures.  Your underpinning knowledge regarding grinding machine operations will be sufficient to provide you with the basis for your work. |

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| Classification ISCED | 0715 Mechanics and metal trades |

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| Available grade | Competent / Not yet competent |

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| Modification history | N/A |

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| **Unit of Competency** | **Performance Criteria** | **Knowledge and Understanding** | **Tools & Equipment** |
| **H1. Perform off-hand grinding** | ***You must be able to:***  **P1.** Select the proper size and shape of grinding wheel.  **P2.** Hold the work piece firmly against the rotating wheel by placing it on the tool rest.  **P3.** Use coolant at intervals to avoid over heating of the job.  **P4.** Adopt technique and methods which are safe.  **P5.** Produce component according to work operations.  **P6.** Observe personal and workplace safety. | ***You must know and understand:***  **K1.** Types of different grinding machines.  **K2.** Type, size and shape of wheels and abrasive.  **K3.** Technique of holding work piece against rotating wheel.  **K4.** Importance of using coolant.  **K5.** Methods and techniques for off-hand grinding.  **K6.** Selecting correct standing position during grinding.  **K7.** Specific safety precautions and guidelines. | **T1**. D-type bevel protector  **T2**. Grinding Machine  **T3**. Personal Protective Equipment  **T4**. Coolant  **T5**. Wheel Dresser stand  **T6**. Dresser |
| **H2. Perform surface grinding** | ***You must be able to:***  **P1.** Select the suitable size and type of grinding wheel. | ***You must know and understand:***  **K1.** Type and size of wheels and abrasive. | **T1**. Surface Grinding Machine |

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| **Unit of Competency** | **Performance Criteria** | **Knowledge and Understanding** | **Tools & Equipment** |
|  | **P2.** Mount the work piece over the holding devices to ensure proper clamping.  **P3.** Dress the wheel with diamond tip if required.  **P4.** Identify reference points on work piece before grinding.  **P5.** Adjust depth of cut according to speed of machine table.  **P6.** Use coolant continuously to avoid over heating of the job.  **P7.** Observe personal and workplace safety. | **K2.** Method of dressing of grinding wheel.  **K3.** Work holding methods which include:   * Magnet Table * Vice * Angle Plate * Machine base   **K4.** Importance of using coolant.  **K5.** Methods and techniques for surface grinding.  **K6.** Selecting right standing position during grinding.  **K7.** Specific safety precautions and guidelines. | **T2**. Holding Devices **T3**. Wheel Dresser **T4**. Grinding Wheels  **T5**. Wheel Dresser Stand  **T6**. Measuring Tools **T7**. Adjustable Wrench T8. Allen Key Set |

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| **Unit of Competency** | **Performance Criteria** | **Knowledge and Understanding** | **Tools & Equipment** |
| **H3. Perform universal cylindrical grinding** | ***You must be able to:***  **P1.** Select the suitable size and type of grinding wheel.  **P2.** Mount work piece according to procedure (e.g. between two centers, chuck, collet, face plate).  **P3.** Ensure the grinding wheel is balanced.  **P4.** Follow suitable method for universal cylindrical grinding to ensure work specifications.  **P5.** Use coolant continuously to avoid overheating of job.  **P6.** Observe personal and workplace safety. | ***You must know and understand:***  **K1.** Types of grinding.  **K2.** Types and sizes of grinding wheels.  **K3.** Procedure of mounting of work piece according to requirements which include:   * Between Two Centers * Chuck * Collet and * Face Plate   **K4.** Importance of balancing the grinding wheel.  **K5.** Procedure of universal cylindrical grinding.  **K6.** Safety precautions and guidelines specific to cylindrical grinding. | **T1**. Universal Cylindrical Grinding Machine.  **T2**. Measuring Instruments  **T3**. Grinding Wheels **T4**. Wheel Dresser **T5**. Dog Carrier  **T6**. Screw Wrench  **T7**. Coolants  **T8**. Allen key Set  **T9**. Personal Protective Equipment |
| **H4. Perform tool and cutter grinding** | ***You must be able to:***  **P1.** Select the suitable size, type and shape of grinding wheel.  **P2.** Mount work piece onto correct attachment for required procedure.  **P3.** Adjust the attachments according to | ***You must know and understand:***  **K1.** Types, sizes and shapes of grinding wheels.  **K2.** Types of attachments and their use.  **K3.** Procedure of mounting of work-piece on to related attachments. | **T1**. Diamond dresser tool  **T2**. Grinding attachment  **T3**. Universal bevel protector |

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| **Unit of Competency** | **Performance Criteria** | **Knowledge and Understanding** | **Tools & Equipment** |
|  | different types of tools and cutter grinding.  **P4.** Follow procedure for sharpening of tools and cutter that is safe and appropriate.  **P5.** Observe personal and safety precautions. | **K4.** Different tools and cutter angles.  **K5.** Procedure of sharpening of tools and cutters.  **K6.** Safety guidelines and precautions. | **T4**. Tool and Cutter Grinding Machine |