



Appendix A24

WORK PROCESS SCHEDULE

AND

RELATED INSTRUCTION OUTLINE

FOR THE OCCUPATION OF:

MECHANICAL ENGINEERING TECHNICIAN

O*NET-SOC CODE: 17-3027.00 RAPIDS CODE: 0777CB



Appendix A24

WORK PROCESS SCHEDULE MECHANICAL ENGINEERING TECHNICIAN O*NET-SOC CODE: 17-3027.00 RAPIDS CODE: 0777CB

This schedule is attached to and a part of these Standards for the above identified occupation.

1. APPRENTICESHIP APPROACH

Time-based Competency-based Hybrid

2. TERM OF APPRENTICESHIP

The term of the occupation shall be defined by the attainment of all competencies of the position, which would be reasonably expected to occur within 2 to 3 years of OJL, supplemented by 155 hours of related instruction during the apprenticeship. The sponsor may recognize prior-learning achievements or demonstration of competencies to account for related instruction or OJL hours.

3. RATIO OF APPRENTICES TO JOURNEYWORKERS

The apprentice to journeyworker ratio is: 1 Apprentice to 1 Journeyworker.

4. APPRENTICE WAGE SCHEDULE

Apprentices shall be paid a progressively increasing schedule of wages. Apprentices' starting wage should be a minimum of \$17.29 per hour. The journeyworker wage is \$20.00 per hour, which is to be paid to the apprentice after completion of the apprenticeship. The starting wage and journeyworker wage may be adjusted to accommodate each employer and shall be uploaded into the Rapids database. This wage scale is specifically for Denver, CO, and may vary based on minimum wage laws in different geographic locations, which will be indicated on Appendix D.

Term:

1 st Period	Starting Wage (0-18 months)	\$17.29/hr
2 nd Period	On level (18-36 months)	\$18.29/hr
Completion	Full Competency	\$20.00/hr

5. PROBATIONARY PERIOD

Every apprentice selected for apprenticeship will serve a probationary period of 500 hours or one year, whichever is shorter.

6. SELECTION PROCEDURES

Please see page A-15.



WORK PROCESS SCHEDULE
MECHANICAL ENGINEERING TECHNICIAN
O*NET-SOC CODE: 17-3027.00 RAPIDS CODE: 0777CB

Description: Mechanical Engineering Technicians use the principles of mechanical engineering to change, test, or calibrate machinery and equipment in order to support a team of engineers and scientists. Mechanical Engineering Technician apprentices may make design sketches, record and analyze data, make calculations and estimates, and report their findings.

On-The-Job Training: Apprentices will receive training in the various work experiences listed below. The order in which this training is given will be determined by the flow of work on the job and will not necessarily be in the order listed.

Ratings are:

- (4) Exceeds Expectations (Advanced)
- (3) Meets Expectations (Proficient)
- (2) Meets Some Expectations (Emerging)
- (1) Does Not Yet Meet Expectations (Novice)
- (0) Not applicable (No Skill)

4. Exceeds Expectations (Advanced): Consistently exceeds performance standard established for the time in position. Achieves results above and beyond what is required. Extends themselves in their roles to exceed personally and as a team to achieve exceptional results.

3. Meets Expectations (Proficient): Employee meets all expectations in a fully satisfactory way and is proficient in the outlined competencies.

2. Meets Some Expectations (Emerging): Meets the performance standards established for time in position. Handles routine tasks & some unexpected situations with the usual amount of supervision. Can continue to develop with coaching, training or more experience to gain proficiency.

1. Does Not Yet Meet Expectations (Novice): Occasionally meets some of the objectives related to this goal but does not meet others in a fully satisfactory way. This performance level generally indicates the need for additional coaching, training or other plan for performance improvements.

0. Not Applicable (No Skill): Training in this competency has not yet begun.

Apprentices need to receive a “3” or better in each competency in order to complete the apprenticeship.



Apprentice Competency Evaluation

Core Competencies	Required for this employer (yes/no)	Rating	Supervisor Sign-off	Date
<p>Computer-Aided Design (CAD) Modeling <i>Uses drafting tools to perform job functions.</i></p> <ul style="list-style-type: none"> ● Resolves common issues with basic troubleshooting techniques. ● Reads technical drawings for other products in order to incorporate them into design. ● Identifies ways to improve own designs with the support of colleagues. ● Appropriately starts projects with support. Follows file development and storage protocols with support. ● Uses resources to independently resolve issues in CAD. ● Identifies ways to improve own designs. ● Uses best practices in CAD to perform job functions with limited supervision. ● Uses best practices in CAD file development and storage. ● Finished product results in minimal errors with minimal guidance from supervisor. ● Designs with fabrication processes in mind. 				
<p>Drawings for Fabrication <i>Creates 2D drawings of 3D models to support fabrication</i></p> <ul style="list-style-type: none"> ● Demonstrates conceptual knowledge of tolerances and how tolerances relate to daily work. ● Articulates the information that is necessary to include on a drawing. ● Includes adequate information in title block per company standard. ● With guidance, completes drawings that can be used by other teams or for production. ● Includes specific and relevant fabrication markings in drawings. ● Uses proper dimensions to maintain design intent. 				



<ul style="list-style-type: none"> Identifies specific tolerances in drawings when relevant. Creates clear drawings that are rarely missing information. 				
<p>Specification <i>Selects components for design with attention to budget and ease of fabrication.</i></p> <ul style="list-style-type: none"> Demonstrates knowledge of metric and standard units. Demonstrates basic knowledge of materials and components used in the company products. Demonstrates familiarity of different fabrication methods and can articulate the basic strengths and weaknesses of each. Demonstrates understanding that their CAD model is something that must be fabricated from real products. Demonstrates understanding of standard vs. custom products. With support of supervisor, chooses components for their design that are easily obtainable and budget conscious. Demonstrates knowledge of how tolerances impact the price and feasibility of a project. Tracks potential vendors and products in an organization system that could be shared with others. Uses existing resources to increase efficiency in selecting components. Finds quotes for project specifications by calling multiple businesses and following up when necessary. With minimal support from supervisor, chooses products to integrate into design. Creates a thorough bill of materials independently and sources the materials from that bill of materials. When specifying product, keeps detailed notes about products and vendors to increase efficiency. 				
<p>Maintenance <i>Supports and collaborates with maintenance personnel.</i></p> <ul style="list-style-type: none"> Identifies what makes a machine easily repairable and maintainable. 				



<ul style="list-style-type: none"> • Appropriately uses maintenance terminology, including acronyms and tools. • Observes a colleague supporting maintenance personnel in repairing equipment and asks appropriate questions. • Demonstrates knowledge of diagnostic process for machinery. • Assists maintenance personnel in diagnosing issues with machinery. • Creates designs with maintenance in mind. • Supports maintenance personnel in repairing equipment with minimal supervision. 				
<p>Safety <i>Integrates safety best practices into all parts of job.</i></p> <ul style="list-style-type: none"> • Identifies potential hazards both in a design and in operational requirements. • Follows all PPE requirements and general workplace safety practices. • Finds applicable OSHA standards to use when designing. • Modifies designs based on safety-related feedback. • Independently identifies hazards and suggests potential solutions. • Creates designs with safety in mind. • Builds safety devices and equipment to assist floor personnel. 				
<p>Prototyping and testing <i>Appropriately designs and tests prototypes</i></p> <ul style="list-style-type: none"> • Identifies design flaws based on test results and researches ways to correct those flaws. • Determines ways to test prototypes with minimal support. • Executes tests on prototypes with minimal support. • Suggests revisions to the design based on research from the previous test. • Determines and executes tests on prototypes independently. 				



<ul style="list-style-type: none"> ● Delineates between effective and ineffective ways to revise a design given the research. ● Applies design revisions with minimal support. ● Creates prototypes to perform tests on with minimal support. 				
<p>Continuous Improvement <i>Evaluates processes to find creative ways to enhance quality, safety, and productivity.</i></p> <ul style="list-style-type: none"> ● Observes manufacturing cell design and interaction. ● Articulates potential ways to improve tedious tasks. ● Asks relevant questions about continuous improvement best practices, including automation. ● Designs individual components of larger manufacturing cells with supervision. ● Develops ways to verify the feasibility of the component design with supervision. ● Creates bill of materials for the individual component designs. ● Translates observations of manufacturing process into new ideas about ways to improve. ● Combines individual machine component designs into a larger cell design. ● Creates a full bill of materials for an entire cell. ● Orders components for a cell. 				
<p>Engineering Workflow Management <i>Manages time and work flow to deliver completed components of a project.</i></p> <ul style="list-style-type: none"> ● Follows supervisor-designed work plan. ● Seeks out constructive criticism on work products and process. ● Delivers results that may need significant revision on their components of the project. ● Begins to participate in design of work plan. ● Asks appropriate questions about workflow next steps and sometimes 				



<p>makes independent choices about workflow.</p> <ul style="list-style-type: none">● Identifies key points to seek feedback and proactively seeks that feedback.● Delivers results that may need some revision on their components of the project.● Takes ownership of the project while still seeking support from supervisor in order to drive the project towards completion.● Makes both long and short-term decisions to drive the project towards completion.● Identifies barriers and engages others to remove those barriers.● Engages relevant colleagues to create a timeline, order parts, and fabricate.● Proactively provides appropriate status updates and schedules time to review project when appropriate.● Delivers results that require minimal revision on their components of the project.				
<p>Applied Mathematics <i>Applies basic concepts in geometry, trigonometry, and algebra to design.</i></p> <ul style="list-style-type: none">● Calculates unit conversion.● Converts fractions to decimals and decimals to fractions.● Uses algebraic operations accurately to create technical drawings and/or models.● Uses geometry and/or trigonometry accurately to create features such as tapers, cones, and arcs.				



Apprenticeship Competencies – Career Readiness

In addition to mastering all the essential technical competencies outlined in the work processes, an apprentice must consistently demonstrate growth and proficiency in the following career readiness competencies to complete the apprenticeship.

Apprentices will be evaluated in these competencies semi-annually, and the supervisor will initial and date the accomplishment of the career ready competency at each review.

Ratings are:

- (4) Exceeds Expectations (Advanced)
- (3) Meets Expectations (Proficient)
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ENTREPRENEURIAL SKILLS	Required for this employer (yes/no)	Rating	Supervisor Sign-off	Date
Critical Thinking/Problem Solving <ul style="list-style-type: none"> ● Recognize that problems can be identified, and possible solutions can be generated ● Define the problem using a variety of strategies ● Make connections between information gathered and personal experiences to apply and/or test solutions 				
Creativity / Innovation				



<ul style="list-style-type: none"> • Demonstrate curiosity, imagination and eagerness to learn more • Build on personal experience to specify a challenging problem to investigate • Engage in novel approaches, moves, directions, ideas and/or perspectives 				
Inquiry <ul style="list-style-type: none"> • Recognize and describe cause-and-effect relationships and patterns in everyday experiences • Investigate to form hypotheses, make observations and draw conclusions • Test hypotheses/prototype with planned process for getting feedback 				
Risk Taking <ul style="list-style-type: none"> • Demonstrate a willingness to try new things • Demonstrate flexibility, imagination and inventiveness in taking on tasks and activities • Innovate from failure, connect learning across domains and recognize new opportunities 				

PERSONAL SKILLS	Required for this employer (yes/no)	Rating	Supervisor Sign-off	Date
Self-Management / Self Awareness <ul style="list-style-type: none"> • Accurately recognize one's own emotions, thoughts and values and how they influence behavior • Appropriately express one's own emotions, thoughts and values and identify how they influence behavior • Assess personal strengths and limitations, with a well-grounded sense of confidence, optimism and a 'growth mindset' 				
Self-Direction <ul style="list-style-type: none"> • Recognize personal characteristics, preferences, thoughts and strengths • Pursue opportunities to engage and learn interests • Apply knowledge to set goals, make informed decisions and transfer to new contexts 				
Adaptability / Flexibility <ul style="list-style-type: none"> • Recognize emotional response to ideas that differ from one's own • Regulate reactions to differing perspectives • Look for and value in different perspectives expressed by others 				
Perseverance / Resilience				



<ul style="list-style-type: none"> • Resist distractions, maintain attention, and continue the task at hand through frustration or challenges • Set goals and develop strategies to remain focused on learning goals • Focus on learning goals by employing motivation and familiar strategies for engagement and evaluate progress, making necessary changes to stay the course 				
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CIVIC/INTERPERSONAL SKILLS	Required for this employer (yes/no)	Rating	Supervisor Sign-off	Date
<p>Collaboration / Teamwork</p> <ul style="list-style-type: none"> • Recognize how personal actions have had a positive or negative impact on others with feedback as needed • Recognize how members of a community rely on each other, considering personal contributions as applicable • Follow a process identified by others to help generate ideas, negotiate roles and responsibilities, and respects consensus in decision making 				
<p>Communication</p> <ul style="list-style-type: none"> • Articulate personal strengths and challenges using different forms of communication to express oneself • Consider purpose, formality of context and audience, and distinct cultural norms when planning content, mode, delivery and expression • Establish goals for communication and plan out steps accordingly 				
<p>Global / Cultural Awareness</p> <ul style="list-style-type: none"> • Compare attitudes and beliefs as an individual to others • Identify and explain multiple perspectives (cultural, global) when exploring events, ideas and issues • Plan and evaluate complex solutions to global challenges that are appropriate to their contexts using multiple disciplinary perspectives (such as cultural, historical and scientific) 				
<p>Ethics</p> <ul style="list-style-type: none"> • Takes great care with organizational data 				



<ul style="list-style-type: none"> Does not disclose any kind of personal or sensitive organizational information; understands that all data is confidential Demonstrates honesty and integrity in all interactions. If an error is made, prioritizes minimal impact to the organization over their own reputation 				
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PROFESSIONAL SKILLS	Required for this employer (yes/no)	Rating	Supervisor Sign-off	Date
Task/Time Management <ul style="list-style-type: none"> Articulate task requirements and identify deadlines Develop and utilize basic task and time-management strategies effectively Demonstrate task-management attributes associated with producing high-quality products including the abilities to: 1) Work positively and ethically 2) Manage time and projects effectively 3) Multi-task 4) Clearly communicate with others 				
Self-Advocacy <ul style="list-style-type: none"> Appropriately express a range of emotions to communicate personal ideas/needs Ask questions to develop further personal understanding Demonstrate confidence in sharing ideas/feelings 				
Work Ethic <ul style="list-style-type: none"> Complete tasks with ongoing support Seek clarity on tasks and needs occasional support Demonstrate skill in assigned tasks and completes with little or no support 				

ACADEMIC SKILLS	Required for this employer (yes/no)	Rating	Supervisor Sign-off	Date
Core Academic Foundation <ul style="list-style-type: none"> Begins to use math and literacy skills to inform work Uses math and literacy skills to perform job tasks with frequent checks by supervisor Independently and consistently use math and literacy skills to perform tasks (with occasional checks for quality) 				



**RELATED INSTRUCTION OUTLINE
MECHANICAL ENGINEERING TECHNICIAN
O*NET-SOC CODE: 17-3027.00 RAPIDS CODE: 0777CB**

Related instruction - The curriculum is defined as a variety of classes, around which the exams and projects are based. By defining the related instruction this way, all related instruction competencies required of the students are met through a combination of coursework and/or hands-on exercises. Employers will select relevant courses for related instruction in the topics outlined below, totaling **at least 144 hours** over the duration of the apprenticeship. Selection of required topics and associated training time may vary by employer and apprentice. Employer may add additional occupation specific courses as necessary over and above those specified below.

RELATED INSTRUCTION	Approximate Hours
Apprenticeship Orientation	15
Workplace Essentials	45
Employer Onboarding	10
Safety	10
Computer-Aided Design	15
Drawings for Fabrication	15
Continuous Improvement	15
Applied Mathematics	30
TOTAL RI HOURS	155

COURSE DESCRIPTIONS

Apprenticeship Orientation (15 hours)

Introduction to career-readiness to prepare students for working in a professional environment: apprenticeship and workplace expectations with a focus on growth mindset.

Workplace Essentials (45 hours)

Skills in common computer applications, effective workplace communication, time management, and conflict resolution.

Employer Onboarding (10 hours)

Orientation training provided to new employees by the employer.

Safety (10 hours)

On-the-job safety best practices

Computer-aided Design (15 hours)

Basic 3D modeling



Drawings for Fabrication (15 hours)

2D manufacturing drawing and print reading fundamentals

Continuous Improvement (15 hours)

Fundamentals of quality, job planning, process control, and continuous improvement

Applied Mathematics (30 hours)

Algebra, trigonometry, and geometry fundamentals



SELECTION PROCEDURES

1. Apprenticeship opportunities are shared with students enrolled in CareerWise and its affiliated programs.
 2. Interested applicants complete the application process outlined in the apprenticeship recruitment notice. All suitably qualified applicants can apply to the apprenticeship opportunity.
 3. All applicants that meet the minimum qualifications will be selected for an employer interview.
 4. At the time of interview, applicants will be asked the same set of questions to ensure each applicant is treated equally.
 5. Applicants shall be rated and ranked based on interview scores.
- If required by the employer, the top candidates may be invited for a second interview.
6. The applicants will be notified of the hiring decision in a timely manner and all applicants will be treated equally with regard to notifications.
 7. All records regarding the selection of apprentices will be forwarded to and maintained by the Sponsor (see Sponsor Requirements Guide).

Direct Entry:

The Sponsor may allow direct entry applicants that are part of an employer's incumbent workforce, a qualified pre-apprenticeship program, or Job Corps graduates whose training, similarly, qualifies them for the occupation.