
Appendix A

WORK PROCESS SCHEDULE

AND

RELATED INSTRUCTION OUTLINE



Appendix A

**WORK PROCESS SCHEDULE
DATA ANALYST
(Existing Title: Data Scientist)
O*NET-SOC CODE: 15-2051.00 RAPIDS CODE: 2079CB**

This schedule is attached to and a part of these Standards for the above identified occupation.
On the Job Learning Description:

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 160 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 \$15.87 per hour. The journeyworker wage is \$17.83 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 2022:

1st Period	Starting Wage (0-18 months)	\$15.87/hr.
2nd Period	On level (18-36 months)	\$16.83/hr.
Completion	Full Competency	\$17.83/hr.

5. PROBATIONARY PERIOD

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



6. SELECTION PROCEDURES

Please see page A-16



WORK PROCESS SCHEDULE
DATA ANALYST
(Existing Title: Data Scientist)
O*NET-SOC CODE: 15-2051.00 RAPIDS CODE: 2079CB

Description: The Hospitality Management apprenticeship prepares students for leadership positions in hotel administration and operations. Leveraging social acumen and a customer-focused mentality, they work to provide a positive experience for guests. Hospitality apprentices rotate through different departments in the hotel to develop leadership and management skills as well as learn the technical content related to each area of hotel operations, including safety and security, housekeeping, food and beverage, front desk management, revenue management, financial management, and more.

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>Data Analysis <i>Acquires, organizes, and interprets data from various data sources.</i></p> <ul style="list-style-type: none"> ● Navigates system to access data on a basic level. ● Identifies best practices & concepts regarding how to organize data based on the data analysis request. ● Begins to generate questions & observations about query results. ● Demonstrates an ability to apply and comprehend basic queries or formulas in a program (such as Excel). ● Understands the concepts related to familiarizing with a data set, cleaning a data set, and analyzing relationships between variables. ● Identifies a variety of possible issues in a data set independently. For example, redundant variables or outliers. ● Develops simple formulas/queries to gather necessary data outputs, with support from supervisor. ● Organizes data for analysis, based on best practices for the data analysis business request, with support from supervisor. ● Analyzes data output/query results by performing basic calculations and begins development of the narrative, with support from supervisor. ● With support from supervisor, accesses data set and completes basic summarization and descriptive tasks. ● With support from supervisor, identifies and addresses issues in a data set (e.g., null value treatment or data type conversions). ● Develops simple formulas/queries to gather necessary data outputs. ● Organizes data for analysis, based on best practice for the data analysis business request. ● Analyzes data output/query results to begin development of the narrative. 				



<ul style="list-style-type: none"> ● Independently accesses data set from and completes summarization and descriptive tasks. ● Identifies and addresses a variety of possible issues in a data set independently. For example, redundant variables or outliers. ● Develops complex formulas/queries with support from supervisor. ● Anticipates how data will need to be organized and what information will need to be displayed, based on the data analysis business request. ● Generates insights related to the business request, based on data output/query results. 				
<p>Programming for Data Analysis <i>Uses programming language (such as SQL) or Microsoft Excel program to produce data output.</i></p> <ul style="list-style-type: none"> ● Understands the basic purpose and functions for accessing data. ● Uses a tool, such as SQL or Microsoft Excel, that helps generate the data outputs. ● Writes basic Microsoft Excel or SQL (or other relevant language), commands, with support from supervisor. ● Writes basic Microsoft Excel or SQL (or other relevant language) commands. ● Independently writes basic ● SQL (or other relevant language) statements without having to rely on a tool that generates SQL. ● Knows how to use different languages and tools (such as Stata, SASS, SPSS) to create outputs for certain data sets. 				
<p>Data Visualization <i>Translates data into basic visualizations to support in business analytics and problem solving. (Data Visualization tools may include Tableau, Power BI, Salesforce, Looker.)</i></p> <ul style="list-style-type: none"> ● Understands basic visualization functions (ex. drag & drop, tables) inside a graphic user interface (such as Tableau). ● Explores basic visualization options to support the narrative about the data. ● Reviews and provides feedback of visualization tools created by team members and demonstrates an ability to apply basic principles of layout & design. 				



<ul style="list-style-type: none"> ● Creates new visualization reports or customer self-service tools for stakeholders, with support from supervisor. ● Identifies best visualization to support the narrative about the data, with support from supervisor. ● Creates basic visualizations that implement best practices of layout & design, with support from supervisor. ● Preemptively determines the visualizations needed by stakeholders and proactively creates those visualizations or self-service tools. ● Identifies best visualization to support the narrative about the data. ● Creates basic visualizations that consistently implement best practices of layout & design. ● Creates and uses visualizations to generate new insights or hypotheses, beyond what the stakeholder requested, that drive towards current business goals or create new value propositions. ● Communicates how data was gathered, filtered, and displayed in the visualization. ● Acts as a resource for implementing best practices of layout and design. 				
<p>Customer Service <i>Respond to customer requests for support (such as answering a business or technical question or generating reports).</i></p> <ul style="list-style-type: none"> ● Familiar with common questions or the types of support customers need. ● Generates a bank of solutions and processes for commonly asked questions or requests. ● Responds to customers' low-level questions or requests for support, such as delivering a packaged analysis, with support from the supervisor. ● Independently responds to customers' questions or requests for support and seeks solutions, such as creating a data visualization tool or completing new data analysis, as needed. ● Follows up with general respondents to clarify certain questions in the data, such as from survey results. ● Provides responses and/or solutions quickly and independently to customers, well-versed in customer needs. 				



<ul style="list-style-type: none"> ● Follows up with general respondents to clarify certain questions in the data, such as from survey results, and is able to offer an explanation as to why some survey results might be different. 				
<p>Troubleshooting <i>In a technical setting, performs problem resolution and root cause analysis and recommends and implements solutions.</i></p> <ul style="list-style-type: none"> ● Identifies challenges with data and proactively reaches out for support for the specific challenge. ● Recognizes patterns of the challenges encountered in the data analysis process. ● Identifies people and resources that can help with problem resolution and can clearly communicate the challenge. ● Discovers basic solutions to common challenges in the data analysis process. ● Recognizes patterns of challenges in the data analysis process and applies learned solutions to overcome the obstacle. ● Acts as a resource who is called on to support others when resolving problems. 				
<p>Inquiry-Driven Solutions <i>Identifies key business challenges and performs preliminary data collection and root cause analysis to recommend and implement solutions.</i></p> <ul style="list-style-type: none"> ● Generates research questions that initiate the problem-solving process. ● Develops strong inquiry skills regarding which questions to ask, who to ask, and what resources are available, with support from their supervisor. ● Develops simple solutions to implement and resolve problems, using information gathered in inquiry. ● Develops complex solutions to implement and resolve complex problems, using information gathered in inquiry. 				
<p>Communicates Data Insights <i>Tells and adapts a story from the results of a model through a clear, concise explanation in a verbal or written method, that is uniquely framed to the intended audience.</i></p> <ul style="list-style-type: none"> ● Elaborates on basic insights to the team in easy-to-read explanations. 				



<ul style="list-style-type: none"> ● Produces a one pager that summarizes insights and results and justifies recommendations, with support from supervisor. ● Engages with teammates about the results and can answer questions about the results. ● Produces a short memo that elaborates on the insights and the results they got from a certain output and that explains their rationale for their insights. ● Utilizes simple data visualization tools, such as tables or graphs, within memo. ● Produces a research brief with clear and detailed results, insights, and recommendations, and which explains how they got the results and how the results were affected by the certain variables. ● Utilizes complex data visualization tools within memo. 				
<p>Business Acumen <i>Uses understanding of the organization’s priorities, financial model, and operations to guide daily work.</i></p> <ul style="list-style-type: none"> ● Describes the general purpose and goals of the business. ● Discusses the crucial metrics being measured. ● Displays detailed understanding of the customer. ● Understands how data supports the organization in making decisions and achieving its goals. ● Generates data reports that support the organization in achieving their business goals, as requested by the supervisor. ● Anticipates what data or reports would support the organization with decision -making around priorities and goals; efficiently provides the information needed. ● Intuits a customer’s needs and develops an end result that is novel to what the customer requested that may more effectively support educating the customer for decision making. 				

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:

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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 				



<ul style="list-style-type: none"> 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 				

CIVIC/INTERPERSONAL SKILLS	Required for this employer (yes/no)	Rating	Supervisor Sign-off	Date
Collaboration / Teamwork				



<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 				
Communication <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 				
Global / Cultural Awareness <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) 				
Ethics <ul style="list-style-type: none"> Takes great care with organizational data 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 				

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 				



<ul style="list-style-type: none"> • 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
DATA ANALYST
(Existing Title: Data Scientist)
O*NET-SOC CODE: 15-2051.00 RAPIDS CODE: 2079CB

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
Data Analysis	15
Programming for Data Analysis	15
Data Visualization	15
Data Troubleshooting	15
Inquiry-Driven Solutions	15
Data Insights	15
TOTAL RI HOURS	160

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.

Data Analysis (15 hours)

Teaches apprentice to navigate and access data and identify best practices for how to organize and analyze data including generating questions, observations, and a narrative about query results.



Teaches students to understand concepts related to a dataset including cleaning a data set and analyzing relationships between variables.

Programming for Data Analysis (15 hours)

Teaches apprentice programming languages relevant to data analysis such as SQL, Python, & JavaScript, and data analysis platforms such as Tableau and Microsoft Excel. Students learn programming basics to prepare them to work on data analysis in a web-based environment.

Data Visualization (15 hours)

Teaches apprentices data visualization tools to demonstrate data narratives and support business analytics and problem-solving functions. Students learn basic visualization functions, tools, design, layout, and principles.

Data Troubleshooting (15 hours)

Teaches apprentices problem resolution and root cause analysis to be able to recommend and implement technical solutions. Teaches apprentice how to recognize patterns of challenges in data analysis, identify issues in a dataset including data queries. Teaches apprentice to address a variety of possible issues in a data set independently. For example, redundant variables or outliers.

Inquiry-Driven Solutions (15 hours)

Teaches apprentices how to identify key business challenges from a variety of industry datasets, develop inquiry skills regarding preliminary data collection and root cause analysis to recommend industry-focused solutions. Learns to develop industry-relevant inquiry processes regarding questions to ask, stakeholders to ask, and identifying available resources to accomplish efficient and effective data solutions. Learns processes to be able to anticipate what data or reports would support the organization with decision-making around priorities and goals; efficiently provides the information needed.

Data Insights (15 hours)

Teaches apprentices how to communicate a data narrative from the results of a model/analysis. Teaches apprentice how to distill data analysis to produce narratives in both short and long-form such as a memo, one-page recap, narrative report, or a full visual presentation. Teaches apprentices how to use data visualization tools across different narrative outputs including what format is relevant.



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.