



# Automotive Data Science Head

QP Code: ASC/Q6419

Version: 1.0

NSQF Level: 7

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## ASC/Q6419: Automotive Data Science Head

### Brief Job Description

The individual at this job is responsible for management and supervision of designing and development of the visualization platforms for end-to-end visibility, analytics solutions and services, and customer retention strategies based on the customer database. He/She also leads the development activities and guide the team on the technical front in analytics solutions and reviewing of code and design activities, propose suitable solution architecture based on comparative studies. He/She also supports a range of analytical, visualization, and predictive modelling projects along with project management.

### Personal Attributes

The person should be result oriented with good technical and analytical skills, should have Excellent Interpersonal Skills, communication and presentation skills and a good team player. They should have ability to manage projects, prioritizing of work and mentoring the budding engineers

### Applicable National Occupational Standards (NOS)

#### Compulsory NOS:

1. [ASC/N9810: Manage work and resources \(Manufacturing\)](#)
2. [DGT/VSQ/N0104: Employability Skills \(120 Hours\)](#)
3. [ASC/N6441: Supervise and manage model development process](#)
4. [ASC/N6442: Prepare and visualise data by using analytical tools](#)
5. [ASC/N6443: Develop solutions for complex business problems](#)

### Qualification Pack (QP) Parameters

<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Production Engineering
<b>Country</b>	India
<b>NSQF Level</b>	7
<b>Credits</b>	25

<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/ 2521.0100
<b>Minimum Educational Qualification &amp; Experience</b>	<p>B.E./B.Tech with 5 Years of experience in relevant field OR M.E. with 3 Years of experience in relevant field OR M.Tech with 3 Years of experience in relevant field OR Certificate-NSQF (Automotive Manufacturing Data Science Specialist/ Automotive Dealership Data Science Specialist Level 6.5) with 3 Years of experience in relevant field</p>
<b>Minimum Level of Education for Training in School</b>	
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	22 Years
<b>Last Reviewed On</b>	29/03/2023
<b>Next Review Date</b>	29/03/2026
<b>NSQC Approval Date</b>	29/03/2023
<b>Version</b>	1.0

## ASC/N9810: Manage work and resources (Manufacturing)

### Description

This NOS unit is about implementing safety, planning work, adopting sustainable practices for optimising the use of resources.

### Scope

The scope covers the following :

- Maintain safe and secure working environment
- Maintain Health and Hygiene
- Effective waste management practices
- Material/energy conservation practices

### Elements and Performance Criteria

#### *Maintain safe and secure working environment*

To be competent, the user/individual on the job must be able to:

- PC1.** identify hazardous activities and the possible causes of risks or accidents in the workplace
- PC2.** implement safe working practices for dealing with hazards to ensure safety of self and others
- PC3.** conduct regular checks of the machines with support of the maintenance team to identify potential hazards
- PC4.** ensure that all the tools/equipment/fasteners/spare parts are arranged as per specifications/utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions
- PC5.** organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices
- PC6.** fill daily check sheet to report improvements done and risks identified
- PC7.** ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others
- PC8.** report any identified breaches in health, safety and security policies and procedures to the designated person

#### *Maintain Health and Hygiene*

To be competent, the user/individual on the job must be able to:

- PC9.** ensure workplace, equipment, restrooms etc. are sanitized regularly
- PC10.** ensure team is aware about hygiene and sanitation regulations and following them on the shop floor
- PC11.** ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace
- PC12.** report advanced hygiene and sanitation issues to appropriate authority
- PC13.** follow stress and anxiety management techniques and support employees to cope with stress, anxiety etc
- PC14.** wear and dispose PPEs regularly and appropriately

#### *Effective waste management practices*

To be competent, the user/individual on the job must be able to:

**PC15.** ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP

**PC16.** ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste

*Material/energy conservation practices*

To be competent, the user/individual on the job must be able to:

**PC17.** ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively

**PC18.** prepare and analyze material and energy audit reports to decipher excessive consumption of material and water

**PC19.** identify possibilities of using renewable energy and environment friendly fuels

**PC20.** identify processes where material and energy/electricity utilization can be optimized

### **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

**KU1.** organisation procedures for health, safety and security, individual role and responsibilities in this context

**KU2.** the organisation's emergency procedures for different emergency situations and the importance of following the same

**KU3.** evacuation procedures for workers and visitors

**KU4.** how and when to report hazards as well as the limits of responsibility for dealing with hazards

**KU5.** potential hazards, risks and threats based on the nature of work

**KU6.** various types of fire extinguisher

**KU7.** various types of safety signs and their meaning

**KU8.** appropriate first aid treatment relevant to different condition e.g. bleeding, minor burns, eye injuries etc.

**KU9.** relevant standards, procedures and policies related to 5S followed in the company

**KU10.** the various materials used and their storage norms

**KU11.** importance of efficient utilisation of material and water

**KU12.** basics of electricity and prevalent energy efficient devices

**KU13.** common practices of conserving electricity

**KU14.** common sources and ways to minimize pollution

**KU15.** categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics

**KU16.** waste management techniques

**KU17.** significance of greening

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** read safety instructions/guidelines
- GS2.** modify work practices to improve them
- GS3.** work with supervisors/team members to carry out work related tasks
- GS4.** complete tasks efficiently and accurately within stipulated time
- GS5.** inform/report to concerned person in case of any problem
- GS6.** make timely decisions for efficient utilization of resources
- GS7.** write reports such as accident report, in at least English/regional language

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain safe and secure working environment</i>	<b>20</b>	<b>13</b>	-	<b>8</b>
<b>PC1.</b> identify hazardous activities and the possible causes of risks or accidents in the workplace	4	2	-	2
<b>PC2.</b> implement safe working practices for dealing with hazards to ensure safety of self and others	3	1	-	2
<b>PC3.</b> conduct regular checks of the machines with support of the maintenance team to identify potential hazards	2	2	-	1
<b>PC4.</b> ensure that all the tools/equipment/fasteners/spare parts are arranged as per specifications/utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions	3	2	-	1
<b>PC5.</b> organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices	2	-	-	-
<b>PC6.</b> fill daily check sheet to report improvements done and risks identified	2	2	-	-
<b>PC7.</b> ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others	2	2	-	1
<b>PC8.</b> report any identified breaches in health, safety and security policies and procedures to the designated person	2	2	-	1
<i>Maintain Health and Hygiene</i>	<b>13</b>	<b>7</b>	-	<b>5</b>
<b>PC9.</b> ensure workplace, equipment, restrooms etc. are sanitized regularly	3	2	-	1
<b>PC10.</b> ensure team is aware about hygiene and sanitation regulations and following them on the shop floor	2	1	-	-
<b>PC11.</b> ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace	2	2	-	1
<b>PC12.</b> report advanced hygiene and sanitation issues to appropriate authority	1	1	-	1



<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC13.</b> follow stress and anxiety management techniques and support employees to cope with stress, anxiety etc	2	1	-	1
<b>PC14.</b> wear and dispose PPEs regularly and appropriately	3	-	-	1
<i>Effective waste management practices</i>	<b>6</b>	<b>4</b>	-	<b>1</b>
<b>PC15.</b> ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP	3	2	-	-
<b>PC16.</b> ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste	3	2	-	1
<i>Material/energy conservation practices</i>	<b>11</b>	<b>6</b>	-	<b>6</b>
<b>PC17.</b> ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively	2	2	-	1
<b>PC18.</b> prepare and analyze material and energy audit reports to decipher excessive consumption of material and water	3	2	-	1
<b>PC19.</b> identify possibilities of using renewable energy and environment friendly fuels	3	1	-	2
<b>PC20.</b> identify processes where material and energy/electricity utilization can be optimized	3	1	-	2
<b>NOS Total</b>	<b>50</b>	<b>30</b>	-	<b>20</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N9810
<b>NOS Name</b>	Manage work and resources (Manufacturing)
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	5
<b>Credits</b>	2
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	31/08/2021
<b>Next Review Date</b>	31/08/2024
<b>NSQ Clearance Date</b>	31/08/2021

## **DGT/VSQ/N0104: Employability Skills (120 Hours)**

### **Description**

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

### **Scope**

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

### **Elements and Performance Criteria**

#### *Introduction to Employability Skills*

To be competent, the user/individual on the job must be able to:

- PC1.** understand the significance of employability skills in meeting the current job market requirement and future of work
- PC2.** identify and explore learning and employability relevant portals
- PC3.** research about the different industries, job market trends, latest skills required and the available opportunities

#### *Constitutional values - Citizenship*

To be competent, the user/individual on the job must be able to:

- PC4.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. for personal growth and the nation's progress
- PC5.** follow personal values and ethics such as honesty, integrity, caring and respecting others, etc.
- PC6.** follow and promote environmentally sustainable practices

#### *Becoming a Professional in the 21st Century*

To be competent, the user/individual on the job must be able to:

- PC7.** recognize the significance of 21st Century Skills for employment

**PC8.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

**PC9.** adopt a continuous learning mindset for personal and professional development

#### *Basic English Skills*

To be competent, the user/individual on the job must be able to:

**PC10.** use English as a medium of formal and informal communication while dealing with topics of everyday conversation in different contexts

**PC11.** speak over the phone in English, in an audible manner, using appropriate greetings, opening, and closing statements both on personal and work front

**PC12.** read and understand routine information, notes, instructions, mails, letters etc. written in English

**PC13.** write short messages, notes, letters, e-mails etc., using accurate English

#### *Career Development & Goal Setting*

To be competent, the user/individual on the job must be able to:

**PC14.** identify career goals based on the skills, interests, knowledge, and personal attributes

**PC15.** prepare a career development plan with short- and long-term goals

#### *Communication Skills*

To be competent, the user/individual on the job must be able to:

**PC16.** follow verbal and non-verbal communication etiquette while communicating in professional and public settings

**PC17.** use active listening techniques for effective communication

**PC18.** communicate in writing using appropriate style and format based on formal or informal requirements

**PC19.** work collaboratively with others in a team

#### *Diversity & Inclusion*

To be competent, the user/individual on the job must be able to:

**PC20.** • ensure personal behaviour, conduct, and use appropriate communication by taking gender into consideration

**PC21.** empathize with a PwD and aid a PwD, if asked

**PC22.** escalate any issues related to sexual harassment at the workplace in accordance with the POSH Act

#### *Financial and Legal Literacy*

To be competent, the user/individual on the job must be able to:

**PC23.** identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.

**PC24.** carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook

**PC25.** identify common components of salary and compute income, expenses, taxes, investments etc

**PC26.** identify relevant rights and laws and use legal aids to fight against legal exploitation

#### *Essential Digital Skills*

To be competent, the user/individual on the job must be able to:

- PC27.** operate digital devices and use their features and applications securely and safely
- PC28.** carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.
- PC29.** display responsible online behaviour while using various social media platforms
- PC30.** create a personal email account, send and process received messages as per requirement
- PC31.** carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications
- PC32.** utilize virtual collaboration tools to work effectively

#### *Entrepreneurship*

To be competent, the user/individual on the job must be able to:

- PC33.** identify different types of Entrepreneurship and Enterprises
- PC34.** use research and networking skills to identify and assess opportunities for potential business
- PC35.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion
- PC36.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

#### *Customer Service*

To be competent, the user/individual on the job must be able to:

- PC37.** identify different types of customers
- PC38.** identify and respond to customer requests and needs in a professional manner
- PC39.** use appropriate tools to collect customer feedback
- PC40.** follow appropriate hygiene and grooming standards

#### *Getting ready for apprenticeship & Jobs*

To be competent, the user/individual on the job must be able to:

- PC41.** create a professional Curriculum vitae (Résumé)
- PC42.** search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively
- PC43.** apply to identified job openings using offline /online methods as per requirement
- PC44.** answer questions politely, with clarity and confidence, during recruitment and selection
- PC45.** identify apprenticeship opportunities and register for it as per guidelines and requirements

### **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** need for employability skills
- KU2.** different learning and employability related portals
- KU3.** various constitutional and personal values
- KU4.** different environmentally sustainable practices and their importance
- KU5.** Twenty first (21st) century skills and their importance
- KU6.** how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up
- KU7.** importance of career development and setting long- and short-term goals

- KU8.** Do's and don'ts of effective communication
- KU9.** POSH Act
- KU10.** inclusivity and its importance
- KU11.** different types of disabilities and appropriate verbal and non-verbal communication and behaviour towards PwD
- KU12.** different types of financial institutes, products, and services
- KU13.** components of salary and how to compute income and expenditure
- KU14.** importance of maintaining safety and security in offline and online financial transactions
- KU15.** different legal rights and laws
- KU16.** different types of digital devices and the procedure to operate them safely and securely
- KU17.** how to create and operate an e- mail account
- KU18.** use applications such as word processors, spreadsheets etc.
- KU19.** different types of Enterprises and ways to identify business opportunities
- KU20.** types and needs of customers
- KU21.** how to apply for a job and prepare for an interview
- KU22.** apprenticeship scheme and the process of registering on apprenticeship portal

## **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** read and write different types of documents/instructions/correspondence in English and other languages
- GS2.** communicate effectively using appropriate language in formal and informal settings
- GS3.** behave politely and appropriately with all to maintain effective work relationship
- GS4.** how to work in a virtual mode, using various technological platforms
- GS5.** perform calculations efficiently
- GS6.** solve problems effectively
- GS7.** pay attention to details
- GS8.** manage time efficiently
- GS9.** maintain hygiene and sanitization to avoid infection

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	<b>1</b>	<b>1</b>	-	-
<b>PC1.</b> understand the significance of employability skills in meeting the current job market requirement and future of work	-	-	-	-
<b>PC2.</b> identify and explore learning and employability relevant portals	-	-	-	-
<b>PC3.</b> research about the different industries, job market trends, latest skills required and the available opportunities	-	-	-	-
<i>Constitutional values - Citizenship</i>	<b>2</b>	<b>1</b>	-	-
<b>PC4.</b> recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. for personal growth and the nation's progress	-	-	-	-
<b>PC5.</b> follow personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
<b>PC6.</b> follow and promote environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	<b>2</b>	<b>3</b>	-	-
<b>PC7.</b> recognize the significance of 21st Century Skills for employment	-	-	-	-
<b>PC8.</b> practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
<b>PC9.</b> adopt a continuous learning mindset for personal and professional development	-	-	-	-
<i>Basic English Skills</i>	<b>2</b>	<b>3</b>	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC10.</b> use English as a medium of formal and informal communication while dealing with topics of everyday conversation in different contexts	-	-	-	-
<b>PC11.</b> speak over the phone in English, in an audible manner, using appropriate greetings, opening, and closing statements both on personal and work front	-	-	-	-
<b>PC12.</b> read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
<b>PC13.</b> write short messages, notes, letters, e-mails etc., using accurate English	-	-	-	-
<i>Career Development &amp; Goal Setting</i>	<b>1</b>	<b>2</b>	-	-
<b>PC14.</b> identify career goals based on the skills, interests, knowledge, and personal attributes	-	-	-	-
<b>PC15.</b> prepare a career development plan with short- and long-term goals	-	-	-	-
<i>Communication Skills</i>	<b>2</b>	<b>3</b>	-	-
<b>PC16.</b> follow verbal and non-verbal communication etiquette while communicating in professional and public settings	-	-	-	-
<b>PC17.</b> use active listening techniques for effective communication	-	-	-	-
<b>PC18.</b> communicate in writing using appropriate style and format based on formal or informal requirements	-	-	-	-
<b>PC19.</b> work collaboratively with others in a team	-	-	-	-
<i>Diversity &amp; Inclusion</i>	<b>1</b>	<b>2</b>	-	-
<b>PC20.</b> <ul style="list-style-type: none"> <li>• ensure personal behaviour, conduct, and use appropriate communication by taking gender into</li> <li>• consideration</li> </ul>	-	-	-	-
<b>PC21.</b> empathize with a PwD and aid a PwD, if asked	-	-	-	-



<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC22.</b> escalate any issues related to sexual harassment at the workplace in accordance with the POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	<b>2</b>	<b>3</b>	-	-
<b>PC23.</b> identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.	-	-	-	-
<b>PC24.</b> carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook	-	-	-	-
<b>PC25.</b> identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
<b>PC26.</b> identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	<b>2</b>	<b>3</b>	-	-
<b>PC27.</b> operate digital devices and use their features and applications securely and safely	-	-	-	-
<b>PC28.</b> carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.	-	-	-	-
<b>PC29.</b> display responsible online behaviour while using various social media platforms	-	-	-	-
<b>PC30.</b> create a personal email account, send and process received messages as per requirement	-	-	-	-
<b>PC31.</b> carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications	-	-	-	-
<b>PC32.</b> utilize virtual collaboration tools to work effectively	-	-	-	-
<i>Entrepreneurship</i>	<b>2</b>	<b>3</b>	-	-
<b>PC33.</b> identify different types of Entrepreneurship and Enterprises	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC34.</b> use research and networking skills to identify and assess opportunities for potential business	-	-	-	-
<b>PC35.</b> develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
<b>PC36.</b> identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
<i>Customer Service</i>	<b>1</b>	<b>2</b>	-	-
<b>PC37.</b> identify different types of customers	-	-	-	-
<b>PC38.</b> identify and respond to customer requests and needs in a professional manner	-	-	-	-
<b>PC39.</b> use appropriate tools to collect customer feedback	-	-	-	-
<b>PC40.</b> follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship &amp; Jobs</i>	<b>2</b>	<b>4</b>	-	-
<b>PC41.</b> create a professional Curriculum vitae (Résumé)	-	-	-	-
<b>PC42.</b> search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
<b>PC43.</b> apply to identified job openings using offline /online methods as per requirement	-	-	-	-
<b>PC44.</b> answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
<b>PC45.</b> identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
<b>NOS Total</b>	<b>20</b>	<b>30</b>	-	-

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	DGT/VSQ/N0104
<b>NOS Name</b>	Employability Skills (120 Hours)
<b>Sector</b>	Cross Sectoral
<b>Sub-Sector</b>	Professional Skills
<b>Occupation</b>	Employability
<b>NSQF Level</b>	6
<b>Credits</b>	4
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	27/05/2021
<b>Next Review Date</b>	27/05/2024
<b>NSQF Clearance Date</b>	27/05/2021

## **ASC/N6441: Supervise and manage model development process**

### **Description**

This NOS unit is about supervising and managing tasks related to defining the strategies for data analytics solutions related to justify the investment on analytics resources. This is also about selection of hardware for advanced computing used in manufacturing processes to meet the specification set by the organization.

### **Scope**

The scope covers the following :

- Define the strategies for analytics solutions.
- Supervise the development of Analytics models and model lifecycle

### **Elements and Performance Criteria**

#### *Define the strategies for analytics solutions*

To be competent, the user/individual on the job must be able to:

- PC1.** Identify the number of key opportunities to create data analytics solutions in alignment with the business objectives
- PC2.** Compare results to industry norms and make note of how each business segment is served by the organization's data and which areas are missing out on actionable insights
- PC3.** Establish a framework for how business segments will acquire the skills required to respond to enquiries, affect operations and enhance reporting

#### *Supervise the development of Analytics models and model lifecycle*

To be competent, the user/individual on the job must be able to:

- PC4.** Select the development environment and programming language for coding the backend for relation mapping and retrieve data from DBMS
- PC5.** Support the team in designing of effective and efficient solutions for model lifecycle
- PC6.** Supervise Application Programming Interfaces (APIs) development and administration activities
- PC7.** Support the team in reviewing, writing and testing the development solutions for coderelated problems
- PC8.** Identify the different algorithms to be used to solve a particular business problem
- PC9.** Define priority tasks for the data preparation and optimize it in the model lifecycle
- PC10.** Define and address the edge case samples where the false positives and false negatives are more
- PC11.** Monitor the test results in between the development of the software and Dashboards closely to understand its feasibility and optimization

### **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** Product portfolio of organization
- KU2.** Company manufacturing processes
- KU3.** Standard Operation Procedures (SOP) recommended by manufacturer for using equipment /machinery in use
- KU4.** Who to involve while developing the different stages in the machine learning lifecycle
- KU5.** Descriptive and Inferential statistics for creating charts and predictive analytics modelling
- KU6.** Types of data wrangling and data cleaning methods to create visualization
- KU7.** Different frameworks in machine learning model lifecycle
- KU8.** How the key performing indicators of different business segments of the company relate to data analytics solutions chartered
- KU9.** How to use different machine learning algorithms for specific functions like regression,classification and clustering
- KU10.** How to use python programming constructs for developing machine learning models using opensource libraries like for example, scikit-learn
- KU11.** How to develop necessary front end to consume the developed analytics solution

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** follow instructions, guidelines, procedures, rules, and service level agreements
- GS2.** listen effectively and communicate information accurately
- GS3.** follow rule-based decision-making processes
- GS4.** make decisions on suitable courses
- GS5.** plan and organize the work to achieve targets and meet deadlines
- GS6.** apply problem-solving approaches to different situations
- GS7.** analyse the business impact and disseminate relevant information to others
- GS8.** apply balanced judgments to different situations
- GS9.** check the work is complete and free from errors

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Define the strategies for analytics solutions</i>	<b>11</b>	<b>11</b>	-	<b>5</b>
<b>PC1.</b> Identify the number of key opportunities to create data analytics solutions in alignment with the business objectives	3	3	-	1
<b>PC2.</b> Compare results to industry norms and make note of how each business segment is served by the organization's data and which areas are missing out on actionable insights	4	4	-	2
<b>PC3.</b> Establish a framework for how business segments will acquire the skills required to respond to enquiries, affect operations and enhance reporting	4	4	-	2
<i>Supervise the development of Analytics models and model lifecycle</i>	<b>29</b>	<b>29</b>	-	<b>15</b>
<b>PC4.</b> Select the development environment and programming language for coding the backend for relation mapping and retrieve data from DBMS	5	5	-	3
<b>PC5.</b> Support the team in designing of effective and efficient solutions for model lifecycle	5	5	-	3
<b>PC6.</b> Supervise Application Programming Interfaces (APIs) development and administration activities	4	4	-	2
<b>PC7.</b> Support the team in reviewing, writing and testing the development solutions for coderelated problems	4	4	-	2
<b>PC8.</b> Identify the different algorithms to be used to solve a particular business problem	3	3	-	2
<b>PC9.</b> Define priority tasks for the data preparation and optimize it in the model lifecycle	3	3	-	1
<b>PC10.</b> Define and address the edge case samples where the false positives and false negatives are more	2	2	-	1

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC11.</b> Monitor the test results in between the development of the software and Dashboards closely to understand its feasibility and optimization	3	3	-	1
<b>NOS Total</b>	<b>40</b>	<b>40</b>	-	<b>20</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N6441
<b>NOS Name</b>	Supervise and manage model development process
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Production Engineering
<b>NSQF Level</b>	7
<b>Credits</b>	7
<b>Version</b>	1.0
<b>Next Review Date</b>	NA



## ASC/N6442: Prepare and visualise data by using analytical tools

### Description

This NOS unit is about performing exploratory data analysis on the data extracted, deciding which data attributes are required for analysing the extracted attributes using excel/ open-source python libraires.

### Scope

The scope covers the following :

- Support team during analysis of business goals and data attributes
- Supervise team during Statistical analysis of data

### Elements and Performance Criteria

#### *Support team during analysis of business goals and data attributes*

To be competent, the user/individual on the job must be able to:

- PC1.** Define a business problem and business goal
- PC2.** Select the relevant source of data to define business goa
- PC3.** Support the team in validating the criterion in the business problem with domain person
- PC4.** Support the team in creating set of metadata for the selected dataset
- PC5.** Identify the attributes or columns in the datasets which are most significant from analysis perspective
- PC6.** Perform exploratory data analysis to check for missing or duplicate data

#### *Supervise team during Statistical analysis of data*

To be competent, the user/individual on the job must be able to:

- PC7.** Guide the team in performing descriptive statistics and inferential statistics on the data by following SOP
- PC8.** Approve the list of highly correlated attributes prepare by team
- PC9.** Supervise team in finding correlation amongst the selected attributes of the data and plotting their heatmap

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** Organizational policies, procedures, and guidelines that relate to designing and maintaining databases
- KU2.** Organizational policies and procedures for sharing data
- KU3.** Organizational policies and procedures for documenting databases architectures and backup mechanisms
- KU4.** Descriptive and Inferential statistics for creating charts and predictive analytics modelling
- KU5.** Types of data wrangling and data cleaning methods to create visualization
- KU6.** Suitable documentation of the organization for the metadata creation

**KU7.** Aggregate the charts to create a dashboard to address the business problem

**KU8.** Addition of filters and chart tips to make the dashboard interactive

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

**GS1.** follow instructions, guidelines, procedures, rules, and service level agreements

**GS2.** listen effectively and communicate information accurately

**GS3.** follow rule-based decision-making processes

**GS4.** make decisions on suitable courses

**GS5.** plan and organize the work to achieve targets and meet deadlines

**GS6.** apply problem-solving approaches to different situations

**GS7.** analyse the business impact and disseminate relevant information to others

**GS8.** apply balanced judgments to different situations

**GS9.** check the work is complete and free from errors

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Support team during analysis of business goals and data attributes</i>	<b>27</b>	<b>27</b>	-	<b>13</b>
<b>PC1.</b> Define a business problem and business goal	3	3	-	1
<b>PC2.</b> Select the relevant source of data to define business goal	3	3	-	2
<b>PC3.</b> Support the team in validating the criterion in the business problem with domain person	6	6	-	3
<b>PC4.</b> Support the team in creating set of metadata for the selected dataset	6	6	-	3
<b>PC5.</b> Identify the attributes or columns in the datasets which are most significant from analysis perspective	4	4	-	2
<b>PC6.</b> Perform exploratory data analysis to check for missing or duplicate data	5	5	-	2
<i>Supervise team during Statistical analysis of data</i>	<b>13</b>	<b>13</b>	-	<b>7</b>
<b>PC7.</b> Guide the team in performing descriptive statistics and inferential statistics on the data by following SOP	6	6	-	3
<b>PC8.</b> Approve the list of highly correlated attributes prepare by team	3	3	-	2
<b>PC9.</b> Supervise team in finding correlation amongst the selected attributes of the data and plotting their heatmap	4	4	-	2
<b>NOS Total</b>	<b>40</b>	<b>40</b>	-	<b>20</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N6442
<b>NOS Name</b>	Prepare and visualise data by using analytical tools
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Production Engineering
<b>NSQF Level</b>	7
<b>Credits</b>	6
<b>Version</b>	1.0
<b>Next Review Date</b>	NA

## ASC/N6443: Develop solutions for complex business problems

### Description

This NOS unit is about developing machine learning models using the extracted data and making predictive analytics solutions for complex business problems. It also involves project management using project tracking tools and task prioritization for all team members

### Scope

The scope covers the following :

- Execute training phase in the machine learning project lifecycle
- Execute testing phase in the machine learning project lifecycle
- Deployment of the developed analytics model solution into production
- Deployment of the analytics model solution into production line

### Elements and Performance Criteria

#### *Execute training phase in the machine learning project lifecycle*

To be competent, the user/individual on the job must be able to:

- PC1.** Select and install relevant libraries and tools for model making
- PC2.** Split and prepare the dataset into training, validation and testing sets
- PC3.** Configure hyperparameters for the selected model, establish the training pipelines and execute the training phase
- PC4.** Store the model and network parameters to be used in the testing phase
- PC5.** Prevent underfitting and overfitting of the model
- PC6.** Solve the imbalanced dataset problem when the samples from minority class are very few
- PC7.** Evaluate the training performance of the machine learning model for training and validation accuracy

#### *Execute testing phase in the machine learning project lifecycle*

To be competent, the user/individual on the job must be able to:

- PC8.** Test the models with testing datasets
- PC9.** Ensure the inference time per sample is as per the business requirement
- PC10.** Evaluate the testing performance of the machine learning model for testing accuracy

#### *Deployment of the developed analytics model solution into production*

To be competent, the user/individual on the job must be able to:

- PC11.** Develop a front-end application to fetch inputs from the user and consume developed model for inference
- PC12.** Verify the production performance of the machine learning model
- PC13.** Analyse performance of the machine learning model and prepare feedback on the wrong predictions
- PC14.** Implement the feedback back to the training phase and retrain the machine learning model

#### *Deployment of the analytics model solution into production line*

To be competent, the user/individual on the job must be able to:

- PC15.** Select relevant libraries and machine learning operations (MLOPS) tools and packages for deploying the analytics model solution into production line
- PC16.** Install the selected libraries and tools for machine learning operations tasks
- PC17.** Setup the continuous training, continuous integration, and continuous delivery pipelines for the developed machine learning models
- PC18.** Monitor the analytics model solution performance in the deployment phase
- PC19.** Carry out commissioning of the end-to-end system

## **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** Organizational policies, procedures, and guidelines that relate to designing and maintaining databases
- KU2.** Organizational policies and procedures for sharing data
- KU3.** Organizational policies and procedures for documenting databases architectures and backup mechanisms
- KU4.** Who to involve while developing the different stages in the machine learning lifecycle
- KU5.** Descriptive and Inferential statistics for creating charts and predictive analytics modelling
- KU6.** Types of data wrangling and data cleaning methods to create visualization
- KU7.** Suitable documentation of the organization for the metadata creation
- KU8.** Updated internal and external network regulations
- KU9.** How to make an API interface for the developed machine learning model in Python using REST API framework
- KU10.** How to diagnose and resolve underfitting, overfitting and imbalanced dataset issues
- KU11.** How to use different machine learning algorithms for specific functions like regression, classification and clustering
- KU12.** How to use python programming constructs for developing machine learning models using open-source libraries like for example, scikit-learn
- KU13.** How to develop necessary front end to consume the developed analytics solution

## **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** Follow instructions, guidelines, procedures, rules, and service level agreements
- GS2.** Listen effectively and communicate information accurately
- GS3.** Follow rule-based decision-making processes
- GS4.** Make decisions on suitable courses
- GS5.** Plan and organize the work to achieve targets and meet deadlines
- GS6.** Apply problem-solving approaches to different situations
- GS7.** Analyse the business impact and disseminate relevant information to others
- GS8.** Apply balanced judgments to different situations
- GS9.** Check the work is complete and free from errors

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Execute training phase in the machine learning project lifecycle</i>	<b>16</b>	<b>16</b>	-	<b>7</b>
<b>PC1.</b> Select and install relevant libraries and tools for model making	2	2	-	1
<b>PC2.</b> Split and prepare the dataset into training, validation and testing sets	3	3	-	1
<b>PC3.</b> Configure hyperparameters for the selected model, establish the training pipelines and execute the training phase	3	3	-	1
<b>PC4.</b> Store the model and network parameters to be used in the testing phase	2	2	-	1
<b>PC5.</b> Prevent underfitting and overfitting of the model	2	2	-	1
<b>PC6.</b> Solve the imbalanced dataset problem when the samples from minority class are very few	2	2	-	1
<b>PC7.</b> Evaluate the training performance of the machine learning model for training and validation accuracy	2	2	-	1
<i>Execute testing phase in the machine learning project lifecycle</i>	<b>5</b>	<b>5</b>	-	<b>3</b>
<b>PC8.</b> Test the models with testing datasets	2	2	-	1
<b>PC9.</b> Ensure the inference time per sample is as per the business requirement	1	1	-	1
<b>PC10.</b> Evaluate the testing performance of the machine learning model for testing accuracy	2	2	-	1
<i>Deployment of the developed analytics model solution into production</i>	<b>8</b>	<b>8</b>	-	<b>4</b>
<b>PC11.</b> Develop a front-end application to fetch inputs from the user and consume developed model for inference	2	2	-	1
<b>PC12.</b> Verify the production performance of the machine learning model	2	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC13.</b> Analyse performance of the machine learning model and prepare feedback on the wrong predictions	2	2	-	1
<b>PC14.</b> Implement the feedback back to the training phase and retrain the machine learning model	2	2	-	1
<i>Deployment of the analytics model solution into production line</i>	<b>11</b>	<b>11</b>	-	<b>6</b>
<b>PC15.</b> Select relevant libraries and machine learning operations (MLOPS) tools and packages for deploying the analytics model solution into production line	2	2	-	1
<b>PC16.</b> Install the selected libraries and tools for machine learning operations tasks	2	2	-	1
<b>PC17.</b> Setup the continuous training, continuous integration, and continuous delivery pipelines for the developed machine learning models	3	3	-	2
<b>PC18.</b> Monitor the analytics model solution performance in the deployment phase	2	2	-	1
<b>PC19.</b> Carry out commissioning of the end-to-end system	2	2	-	1
<b>NOS Total</b>	<b>40</b>	<b>40</b>	-	<b>20</b>



## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N6443
<b>NOS Name</b>	Develop solutions for complex business problems
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Production Engineering
<b>NSQF Level</b>	7
<b>Credits</b>	6
<b>Version</b>	1.0
<b>Next Review Date</b>	NA

## Assessment Guidelines and Assessment Weightage

### Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training centre based on these criteria.
5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

### Minimum Aggregate Passing % at QP Level : 70

**(Please note:** Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

## Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N9810.Manage work and resources (Manufacturing)	50	30	-	20	100	15
DGT/VSQ/N0104.Employability Skills (120 Hours)	20	30	-	-	50	10
ASC/N6441.Supervise and manage model development process	40	40	-	20	100	25
ASC/N6442.Prepare and visualise data by using analytical tools	40	40	-	20	100	25
ASC/N6443.Develop solutions for complex business problems	40	40	-	20	100	25
<b>Total</b>	<b>190</b>	<b>180</b>	<b>-</b>	<b>80</b>	<b>450</b>	<b>100</b>

## Acronyms

<b>NOS</b>	National Occupational Standard(s)
<b>NSQF</b>	National Skills Qualifications Framework
<b>QP</b>	Qualifications Pack
<b>TVET</b>	Technical and Vocational Education and Training

## Glossary

<b>Sector</b>	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
<b>Scope</b>	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
<b>Knowledge and Understanding (KU)</b>	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

<p><b>Organisational Context</b></p>	<p>Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.</p>
<p><b>Technical Knowledge</b></p>	<p>Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.</p>
<p><b>Core Skills/ Generic Skills (GS)</b></p>	<p>Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.</p>
<p><b>Electives</b></p>	<p>Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.</p>
<p><b>Options</b></p>	<p>Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.</p>