



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

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Production Engineering
Country	India
NSQF Level	7
Credits	25

Aligned to NCO/ISCO/ISIC Code	NCO-2015/ 2521.0100
Minimum Educational Qualification & Experience	<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>
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	22 Years
Last Reviewed On	NA
Next Review Date	NA
NSQC Approval Date	
Version	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>	20	13	-	8
PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace	4	2	-	2
PC2. implement safe working practices for dealing with hazards to ensure safety of self and others	3	1	-	2
PC3. conduct regular checks of the machines with support of the maintenance team to identify potential hazards	2	2	-	1
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	3	2	-	1
PC5. organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices	2	-	-	-
PC6. fill daily check sheet to report improvements done and risks identified	2	2	-	-
PC7. ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others	2	2	-	1
PC8. 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>	13	7	-	5
PC9. ensure workplace, equipment, restrooms etc. are sanitized regularly	3	2	-	1
PC10. ensure team is aware about hygiene and sanitation regulations and following them on the shop floor	2	1	-	-
PC11. ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace	2	2	-	1
PC12. report advanced hygiene and sanitation issues to appropriate authority	1	1	-	1

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

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9810
NOS Name	Manage work and resources (Manufacturing)
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	2
Version	2.0
Last Reviewed Date	31/08/2021
Next Review Date	31/08/2024
NSQ Clearance Date	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>	1	1	-	-
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	-	-	-	-
<i>Constitutional values - Citizenship</i>	2	1	-	-
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	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	2	3	-	-
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	-	-	-	-
<i>Basic English Skills</i>	2	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
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	-	-	-	-
<i>Career Development & Goal Setting</i>	1	2	-	-
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	-	-	-	-
<i>Communication Skills</i>	2	3	-	-
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	-	-	-	-
<i>Diversity & Inclusion</i>	1	2	-	-
PC20. <ul style="list-style-type: none"> • ensure personal behaviour, conduct, and use appropriate communication by taking gender into • consideration 	-	-	-	-
PC21. empathize with a PwD and aid a PwD, if asked	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. escalate any issues related to sexual harassment at the workplace in accordance with the POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	2	3	-	-
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	-	-	-	-
<i>Essential Digital Skills</i>	2	3	-	-
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	-	-	-	-
<i>Entrepreneurship</i>	2	3	-	-
PC33. identify different types of Entrepreneurship and Enterprises	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
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	-	-	-	-
<i>Customer Service</i>	1	2	-	-
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	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	2	4	-	-
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	-	-	-	-
NOS Total	20	30	-	-

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0104
NOS Name	Employability Skills (120 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	6
Credits	4
Version	1.0
Last Reviewed Date	27/05/2021
Next Review Date	27/05/2024
NSQC Clearance Date	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>	11	11	-	5
PC1. Identify the number of key opportunities to create data analytics solutions in alignment with the business objectives	3	3	-	1
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	4	4	-	2
PC3. 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>	29	29	-	15
PC4. Select the development environment and programming language for coding the backend for relation mapping and retrieve data from DBMS	5	5	-	3
PC5. Support the team in designing of effective and efficient solutions for model lifecycle	5	5	-	3
PC6. Supervise Application Programming Interfaces (APIs) development and administration activities	4	4	-	2
PC7. Support the team in reviewing, writing and testing the development solutions for coderelated problems	4	4	-	2
PC8. Identify the different algorithms to be used to solve a particular business problem	3	3	-	2
PC9. Define priority tasks for the data preparation and optimize it in the model lifecycle	3	3	-	1
PC10. Define and address the edge case samples where the false positives and false negatives are more	2	2	-	1

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

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6441
NOS Name	Supervise and manage model development process
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Production Engineering
NSQF Level	7
Credits	7
Version	1.0
Next Review Date	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>	27	27	-	13
PC1. Define a business problem and business goal	3	3	-	1
PC2. Select the relevant source of data to define business goal	3	3	-	2
PC3. Support the team in validating the criterion in the business problem with domain person	6	6	-	3
PC4. Support the team in creating set of metadata for the selected dataset	6	6	-	3
PC5. Identify the attributes or columns in the datasets which are most significant from analysis perspective	4	4	-	2
PC6. Perform exploratory data analysis to check for missing or duplicate data	5	5	-	2
<i>Supervise team during Statistical analysis of data</i>	13	13	-	7
PC7. Guide the team in performing descriptive statistics and inferential statistics on the data by following SOP	6	6	-	3
PC8. Approve the list of highly correlated attributes prepare by team	3	3	-	2
PC9. Supervise team in finding correlation amongst the selected attributes of the data and plotting their heatmap	4	4	-	2
NOS Total	40	40	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6442
NOS Name	Prepare and visualise data by using analytical tools
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Production Engineering
NSQF Level	7
Credits	6
Version	1.0
Next Review Date	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>	16	16	-	7
PC1. Select and install relevant libraries and tools for model making	2	2	-	1
PC2. Split and prepare the dataset into training, validation and testing sets	3	3	-	1
PC3. Configure hyperparameters for the selected model, establish the training pipelines and execute the training phase	3	3	-	1
PC4. Store the model and network parameters to be used in the testing phase	2	2	-	1
PC5. Prevent underfitting and overfitting of the model	2	2	-	1
PC6. Solve the imbalanced dataset problem when the samples from minority class are very few	2	2	-	1
PC7. 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>	5	5	-	3
PC8. Test the models with testing datasets	2	2	-	1
PC9. Ensure the inference time per sample is as per the business requirement	1	1	-	1
PC10. 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>	8	8	-	4
PC11. Develop a front-end application to fetch inputs from the user and consume developed model for inference	2	2	-	1
PC12. Verify the production performance of the machine learning model	2	2	-	1

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

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6443
NOS Name	Develop solutions for complex business problems
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Production Engineering
NSQF Level	7
Credits	6
Version	1.0
Next Review Date	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
Total	190	180	-	80	450	100

Acronyms

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

Glossary

Sector	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.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	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.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	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.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	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.
Scope	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.
Knowledge and Understanding (KU)	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>Organisational Context</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>Technical Knowledge</p>	<p>Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.</p>
<p>Core Skills/ Generic Skills (GS)</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>Electives</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>Options</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>