7D BIM Creator - BIM & IoT Integration

QP Code: CON/Q2104

Version: 1.0

NSQF Level: 6

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CON/Q2104: 7D BIM Creator - BIM & IoT Integration

Brief Job Description

A 7D BIM Creator - BIM & IoT Integration is responsible for using Building Information Modeling (BIM) and the Internet of Things (IoT) for efficient and effective facility and asset management. The individual monitors the performance of the facility and the assets in it and supports in undertaking appropriate measures for space utilization, retrofitting and renovations, and safety management.

Personal Attributes

The individual should have an eye for detail to identify problems and problem-solving skills to resolve the identified problems promptly. The person should be able to work in coordination with others and have the ability to communicate well verbally and in writing.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. CON/N2108: Integrate IoT with 7D BIM operations

2. CON/N2109: Perform facility and asset management using 7D BIM

3. CON/N9003: Manage health and safety at the workplace

4. DGT/VSQ/N0103: Employability Skills (90 Hours)

Qualification Pack (QP) Parameters

Sector	Construction
Sub-Sector	
Occupation	Building Information Modeling
Country	India
NSQF Level	6
Credits	20
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2142.9900

Minimum Educational Qualification & Experience	Pursuing first year of 2-year PG program after completing 3 year UG degree OR Completed 4 year UG program (in case of 4-year UG with honours/ honours with research) OR Completed 3 year UG degree with 1 Year of experience in the relevant field OR Completed 2nd year diploma after 12th with 2 Years of experience in the relevant field OR Previous relevant Qualification of NSQF Level (5.5 with 1.5 Years of experience in the relevant field) OR Previous relevant Qualification of NSQF Level (5.0) with 3 Years of experience in the relevant field
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21 Years
Last Reviewed On	NA
Next Review Date	31/08/2026
Deactivation Date	02/01/2025
NSQC Approval Date	31/08/2023
Version	1.0
Reference code on NQR	QG-06-CO-00784-2023-V1-CSDCI
NQR Version	1

CON/N2108: Integrate IoT with 7D BIM operations

Description

This OS unit is about integrating IoT with 7D BIM operations and utilizing it for effective facility management.

Scope

The scope covers the following :

- Set up IoT sensors and devices
- Capture and analyze data

Elements and Performance Criteria

Set up IoT sensors and devices

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

PC1. arrange the required number of IoT sensors and devices, e.g. actuators, temperature, light and optical sensors for installation in the facility

PC2. coordinate with the relevant personnel for the installation of IoT- based sensors and devices in the facility to monitor the operations surrounding the building infrastructures

PC3. perform the appropriate testing to ensure the correct functioning of IoT-based sensors and devices

PC4. integrate the IoT-based monitoring system with 7D BIM for efficient and real-time monitoring of the facility, e.g. events and physical changes

Capture and analyze data

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

PC5. create and implement the appropriate BIM IoT workflow, utilizing web-connected devices to supervise and control data exchanges directly from the digital BIM model

PC6. measure temperature and humidity levels, light intensity, movements or any other types of mechanical or physical information with the help of IoT devices and sensors

PC7. use the appropriate IoT-based solutions to reduce the maintenance and energy costs in the facility, e.g. smart lighting system

PC8. use cloud computing to store and utilize the large-scale data generated by IoT devices, with the increased data security and ease of accessing it

PC9. ensure a constant connection between the physical environment and the BIM using IoT-based sensors and devices

PC10. analyze the data captured by IoT-based sensors and devices and take appropriate decisions concerning facility management

PC11. monitor the visual changes in the BIM based on the data transmitted by IoT sensors

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the BIM and how they apply to the design and construction industry

KU2. the objectives of 7D BIM - operations and facility management

KU3. the benefit of using BIM for Facility Management (FM)

KU4. Project Lifecycle Phases (PLPs) in FM

KU5. the importance of using a scalable and configurable BIM management system like BEXEL FM/Docs

KU6. the use of IoT software applications for process control, gathering of real-time data from remote locations to control equipment and conditions

KU7. the benefits of integrating the BIM with the IoT technology for facility management

Generic Skills (GS)

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

GS1. maintain work-related notes and records

GS2. read the relevant literature to learn about the latest developments in the field of work

GS3. listen attentively to understand the information/ instructions being shared by the speaker

GS4. communicate clearly and politely with co-workers and clients

GS5. coordinate with co-workers to achieve work objectives

GS6. plan and prioritize tasks to ensure timely completion

GS7. identify possible disruptions to work and take appropriate preventive measures

GS8. take quick decisions to deal with workplace emergencies/ accidents

GS9. evaluate all possible solutions to a problem to select the best one

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Set up IoT sensors and devices	**13**	**28**	**-**	**4**
PC1. arrange the required number of IoT sensors and devices, e.g. actuators, temperature, light and optical sensors for installation in the facility	-	-	-	-
PC2. coordinate with the relevant personnel for the installation of IoT- based sensors and devices in the facility to monitor the operations surrounding the building infrastructures	-	-	-	-
PC3. perform the appropriate testing to ensure the correct functioning of IoT-based sensors and devices	-	-	-	-
PC4. integrate the IoT-based monitoring system with 7D BIM for efficient and real-time monitoring of the facility, e.g. events and physical changes	-	-	-	-
Capture and analyze data	**17**	**32**	**-**	**6**
PC5. create and implement the appropriate BIM IoT workflow, utilizing web-connected devices to supervise and control data exchanges directly from the digital BIM model	-	-	-	-
PC6. measure temperature and humidity levels, light intensity, movements or any other types of mechanical or physical information with the help of IoT devices and sensors	-	-	-	-
PC7. use the appropriate IoT-based solutions to reduce the maintenance and energy costs in the facility, e.g. smart lighting system	-	-	-	-
PC8. use cloud computing to store and utilize the large-scale data generated by IoT devices, with the increased data security and ease of accessing it	-	-	-	-
PC9. ensure a constant connection between the physical environment and the BIM using IoT-based sensors and devices	-	-	-	-
PC10. analyze the data captured by IoT-based sensors and devices and take appropriate decisions concerning facility management	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. monitor the visual changes in the BIM based on the data transmitted by IoT sensors	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N2108
NOS Name	Integrate IoT with 7D BIM operations
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Building Information Modeling
NSQF Level	6
Credits	8
Version	1.0
Last Reviewed Date	31/08/2023
Next Review Date	31/08/2026
NSQC Clearance Date	31/08/2023

CON/N2109: Perform facility and asset management using 7D BIM

Description

This OS unit is about performing facility and asset management using 7D BIM.

Scope

The scope covers the following :

- Monitor and manage the facility and assets
- Perform post-occupancy evaluations
- Perform space management
- Support in retrofitting and renovations
- Perform safety management
- Carry out reporting

Elements and Performance Criteria

Monitor and manage the facility and assets

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

PC1. create a dynamic model of the facility using BIM to be utilized throughout the facility's lifecycle

PC2. map all facility management processes to the 7D BIM software for their convenient monitoring

PC3. ensure the accuracy of the 7D BIM model for the efficient operation and maintenance of the facility throughout its lifecycle

PC4. create and manage the metadata for building elements

PC5. evaluate the performance of different components at the facility

PC6. assess the performance of assets, such as equipment and Mechanical, Electrical and Plumbing (MEP) systems

PC7. perform asset tracking and management using the 7D BIM software

PC8. manage assets, and maintain/ replace their parts efficiently

PC9. monitor and organize the maintenance processes

PC10. schedule preventative maintenance of the facility using the 7D BIM software

PC11. monitor the facility maintenance costs and identify ways to reduce the overall maintenance cost

PC12. optimize resource utilization and maintenance costs through continuous and up-to-date monitoring systems

PC13. facilitate the audits of building facility

PC14. ensure efficiency, safety and compliance with building standards throughout the lifecycle of the building

PC15. ensure access to the building database for the users/ owners through a secure web-based environment

Perform post-occupancy evaluations

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

PC16. conduct Post-Occupancy Evaluations (POE) to evaluate the built environment of the facility

PC17. use Augmented Reality (AR) while conducting POE to get an accurate impression of resident interventions to assist in the adjustment of future developments

PC18. follow the appropriate Quality Assurance (QA) processes to identify and eliminate flaws in the model in the planning and designing phase

PC19. identify the essential elements and values to be integrated into the design process of similar new structures in the future

Perform space management

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

PC20. use the visualization and coordination capabilities of BIM for space divisions, site standard adjustments and suitable departmental allocations for monitoring space utilization

PC21. identify different processes that take place at the facility

PC22. assist in efficient space utilization and operations at the facility (e.g. rooms, and corridors)

PC23. predict the space needs in the facility based on the monitoring

Support in retrofitting and renovations

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

PC24. use BIM data for conducting feasibility studies

PC25. identify the need of retrofitting the facility components based on the data collected by 7D BIM software

PC26. determine the requirement of replacing parts and carrying out renovations/ repairs using the 7D BIM software

PC27. ensure retrofitting is carried out as per the organizational procedures to adapt to the users' requirements or change of function during the lifecycle of the facility

PC28. use the historical database of the building as a reference for the cost calculation of the proposed improvements

PC29. plan retrofitting, renovations, and destruction of the facility according to the BIM data

Perform safety management

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

PC30. identify the relevant health and safety hazards in the facility through 7D BIM monitoring

PC31. assist in planning the emergency response and recovery strategy with the help of BIM, e.g. generation of evacuation routes depending on the facility user's location

PC32. utilize the BIM data to assist the emergency units in rescue operations and prevent life-threatening hazards

PC33. use the appropriate data security measures to ensure only authorized personnel have access to critical and sensitive BIM data

Carry out reporting

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

PC34. develop context-specific and relational data by processing the collected data

PC35. export BIM data to external databases for use with the relevant asset management systems

PC36. create reports of metadata of the building model to assist with facilities management

PC37. predict the facility and asset performance throughout the lifecycle of the facility

PC38. use the reporting dashboard to collect the relevant data and prepare reports

PC39. follow the appropriate strategies to improve communication among various stakeholders throughout the project lifecycle

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Asset Information Modeling (AIM) and Project Information Modeling (PIM)

KU2. Organizational Information Requirements (OIR), Asset Information Requirements (AIR) and Exchange Information Requirements (EIR)

KU3. the planning and management of maintenance operations throughout a building's lifecycle

KU4. the as-built BIM and the information the relevant building component information it contains, e.g. product data and details, maintenance/ operation manuals, cut sheet specifications, warranty data, manufacturer information, etc.

KU5. the lifecycle BIM strategies

KU6. the BIM embedded Operations and Maintenance (O&M) manuals

KU7. the Construction Operations Building Information Exchange (COBie) data population and extraction

KU8. the BIM maintenance plans

KU9. the BIM file hosting

KU10. the Level of Development (LOD) 400 and 500

KU11. how to create and manage metadata for building elements

KU12. the methods of creation, evaluation, and exchange of BIM

KU13. how to leverage BIM and 7D modeling for construction optimization and sustainable building initiatives

KU14. Programming - Using a spatial program to efficiently and accurately assess a design's performance and effectiveness relative to the spatial requirements

KU15. record modeling - creating an accurate depiction of the physical conditions, environment, and assets of a facility

KU16. preventative maintenance scheduling - tracking and maintaining lifecycle information about the building structure as well as the equipment, planning and scheduling a program of maintenance activities that will improve building performance, reduce repairs, and reduce overall maintenance costs using BIM Management software

KU17. asset management - linking data in a BIM record model to a database of building assets to assist in efficiently maintaining and operating the facility using the appropriate software

KU18. space management and tracking - allocating, managing, and tracking spaces and related resources within a facility

KU19. the collaborative use of BIM information in making design and construction decisions, with a facilities/operations management framework

Generic Skills (GS)

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

GS1. maintain work-related notes and records

GS2. read the relevant literature to learn about the latest developments in the field of work

GS3. communicate clearly and politely with co-workers and clients

GS4. listen attentively to understand the information/ instructions being shared by the speaker

GS5. plan and prioritize tasks to ensure timely completion

GS6. coordinate with co-workers to achieve work objectives

GS7. take quick decisions to deal with workplace emergencies/ accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Monitor and manage the facility and assets	**9**	**18**	**-**	**3**
PC1. create a dynamic model of the facility using BIM to be utilized throughout the facility's lifecycle	-	-	-	-
PC2. map all facility management processes to the 7D BIM software for their convenient monitoring	-	-	-	-
PC3. ensure the accuracy of the 7D BIM model for the efficient operation and maintenance of the facility throughout its lifecycle	-	-	-	-
PC4. create and manage the metadata for building elements	-	-	-	-
PC5. evaluate the performance of different components at the facility	-	-	-	-
PC6. assess the performance of assets, such as equipment and Mechanical, Electrical and Plumbing (MEP) systems	-	-	-	-
PC7. perform asset tracking and management using the 7D BIM software	-	-	-	-
PC8. manage assets, and maintain/ replace their parts efficiently	-	-	-	-
PC9. monitor and organize the maintenance processes	-	-	-	-
PC10. schedule preventative maintenance of the facility using the 7D BIM software	-	-	-	-
PC11. monitor the facility maintenance costs and identify ways to reduce the overall maintenance cost	-	-	-	-
PC12. optimize resource utilization and maintenance costs through continuous and up-to-date monitoring systems	-	-	-	-
PC13. facilitate the audits of building facility	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. ensure efficiency, safety and compliance with building standards throughout the lifecycle of the building	-	-	-	-
PC15. ensure access to the building database for the users/ owners through a secure web-based environment	-	-	-	-
Perform post-occupancy evaluations	**4**	**8**	**-**	**1**
PC16. conduct Post-Occupancy Evaluations (POE) to evaluate the built environment of the facility	-	-	-	-
PC17. use Augmented Reality (AR) while conducting POE to get an accurate impression of resident interventions to assist in the adjustment of future developments	-	-	-	-
PC18. follow the appropriate Quality Assurance (QA) processes to identify and eliminate flaws in the model in the planning and designing phase	-	-	-	-
PC19. identify the essential elements and values to be integrated into the design process of similar new structures in the future	-	-	-	-
Perform space management	**3**	**6**	**-**	**1**
PC20. use the visualization and coordination capabilities of BIM for space divisions, site standard adjustments and suitable departmental allocations for monitoring space utilization	-	-	-	-
PC21. identify different processes that take place at the facility	-	-	-	-
PC22. assist in efficient space utilization and operations at the facility (e.g. rooms, and corridors)	-	-	-	-
PC23. predict the space needs in the facility based on the monitoring	-	-	-	-
Support in retrofitting and renovations	**5**	**10**	**-**	**2**
PC24. use BIM data for conducting feasibility studies	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC25. identify the need of retrofitting the facility components based on the data collected by 7D BIM software	-	-	-	-
PC26. determine the requirement of replacing parts and carrying out renovations/ repairs using the 7D BIM software	-	-	-	-
PC27. ensure retrofitting is carried out as per the organizational procedures to adapt to the users' requirements or change of function during the lifecycle of the facility	-	-	-	-
PC28. use the historical database of the building as a reference for the cost calculation of the proposed improvements	-	-	-	-
PC29. plan retrofitting, renovations, and destruction of the facility according to the BIM data	-	-	-	-
Perform safety management	**4**	**8**	**-**	**1**
PC30. identify the relevant health and safety hazards in the facility through 7D BIM monitoring	-	-	-	-
PC31. assist in planning the emergency response and recovery strategy with the help of BIM, e.g. generation of evacuation routes depending on the facility user's location	-	-	-	-
PC32. utilize the BIM data to assist the emergency units in rescue operations and prevent life-threatening hazards	-	-	-	-
PC33. use the appropriate data security measures to ensure only authorized personnel have access to critical and sensitive BIM data	-	-	-	-
Carry out reporting	**5**	**10**	**-**	**2**
PC34. develop context-specific and relational data by processing the collected data	-	-	-	-
PC35. export BIM data to external databases for use with the relevant asset management systems	-	-	-	-
PC36. create reports of metadata of the building model to assist with facilities management	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC37. predict the facility and asset performance throughout the lifecycle of the facility	-	-	-	-
PC38. use the reporting dashboard to collect the relevant data and prepare reports	-	-	-	-
PC39. follow the appropriate strategies to improve communication among various stakeholders throughout the project lifecycle	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N2109
NOS Name	Perform facility and asset management using 7D BIM
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Building Information Modeling
NSQF Level	6
Credits	8
Version	1.0
Last Reviewed Date	31/08/2023
Next Review Date	31/08/2026
NSQC Clearance Date	31/08/2023

CON/N9003: Manage health and safety at the workplace

Description

This occupational standards unit is about ensuring health and safety at work. This includes personal health and safety and that of the subordinates, as applicable.

Scope

The scope covers the following :

- Ensure health and safety at work
- Manage workplace emergencies

Elements and Performance Criteria

Ensure health and safety at work

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

PC1. check and ensure the availability of appropriate and usable Personal Protective Equipment (PPE) at the workplace

PC2. use the appropriate PPE according to the nature of work and ensure other personnel also do the same

PC3. create awareness regarding health and safety practices at work

PC4. follow and promote the appropriate measures to ensure hygiene in the workplace, e.g. regular cleaning and sanitization

PC5. coordinate regular workplace audits to ensure safe working conditions

PC6. identify health and safety hazards at the workplace and take appropriate preventive measures

PC7. report any out-of-authority health and safety issues to the relevant authority for a timely resolution

PC8. identify the instances of non-compliance with the health and safety policies and take appropriate measures, e.g. giving feedback to the relevant personnel

Manage workplace emergencies

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

PC9. ensure the availability of the updated first aid kit at the workplace

PC10. ensure prompt and timely medical attention for any injured/ unwell personnel

PC11. arrange for effective training of personnel on emergency procedures

PC12. manage workplace emergencies, such as fire, accidents, disease outbreaks or natural calamities following the organizational policies

PC13. follow the applicable emergency procedures and ensure the personnel also do the same

PC14. ensure the safe use of emergency equipment, e.g. fire extinguishers, according to the manufacturer's instructions

PC15. arrange for the emergency equipment to be repaired or replaced, as required

PC16. maintain records of workplace emergencies and report them to the relevant authority in compliance with the applicable regulatory requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the applicable regulations concerning workplace health and safety

KU2. various practices to ensure personal health and safety at the workplace

KU3. the importance of ensuring the use of appropriate at the workplace

KU4. the importance of ensuring that PPE, emergency equipment and first-aid kit at the workplace are up to date and usable condition

KU5. the applicable practices for sanitizing the workplace

KU6. the process of identifying health and safety hazards at the workplace and taking appropriate preventive measures

KU7. the importance of regular workplace audits to ensure safe working conditions

KU8. the appropriate action to be taken to deal with workplace emergencies such as fire, accidents, disease outbreaks or natural calamities

KU9. the process of providing first aid and requesting further medical assistance

KU10. safe use of the emergency equipment as per the manufacturer's instructions

KU11. the process of reporting workplace emergencies/ accidents to the relevant authority in compliance with the organizational and regulatory requirements

Generic Skills (GS)

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

GS1. maintain the appropriate data and records

GS2. read the appropriate reports and literature concerning the field of work

GS3. communicate professionally with all the stakeholders

GS4. listen attentively to understand the information/ instructions being shared and take appropriate action

GS5. coordinate with co-workers to achieve the work objectives

GS6. plan and execute tasks based on priority

GS7. identify possible disruptions to work and take appropriate mitigation measures

GS8. take prompt action to deal with workplace emergencies and accidents

GS9. evaluate all possible solutions to work-related problems and select the best one

GS10. follow the recommended practices for the timely completion of work and achievement of organizational objectives

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Ensure health and safety at work	**25**	**35**	**-**	**-**
PC1. check and ensure the availability of appropriate and usable Personal Protective Equipment (PPE) at the workplace	-	-	-	-
PC2. use the appropriate PPE according to the nature of work and ensure other personnel also do the same	-	-	-	-
PC3. create awareness regarding health and safety practices at work	-	-	-	-
PC4. follow and promote the appropriate measures to ensure hygiene in the workplace, e.g. regular cleaning and sanitization	-	-	-	-
PC5. coordinate regular workplace audits to ensure safe working conditions	-	-	-	-
PC6. identify health and safety hazards at the workplace and take appropriate preventive measures	-	-	-	-
PC7. report any out-of-authority health and safety issues to the relevant authority for a timely resolution	-	-	-	-
PC8. identify the instances of non-compliance with the health and safety policies and take appropriate measures, e.g. giving feedback to the relevant personnel	-	-	-	-
Manage workplace emergencies	**15**	**25**	**-**	**-**
PC9. ensure the availability of the updated first aid kit at the workplace	-	-	-	-
PC10. ensure prompt and timely medical attention for any injured/ unwell personnel	-	-	-	-
PC11. arrange for effective training of personnel on emergency procedures	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. manage workplace emergencies, such as fire, accidents, disease outbreaks or natural calamities following the organizational policies	-	-	-	-
PC13. follow the applicable emergency procedures and ensure the personnel also do the same	-	-	-	-
PC14. ensure the safe use of emergency equipment, e.g. fire extinguishers, according to the manufacturer's instructions	-	-	-	-
PC15. arrange for the emergency equipment to be repaired or replaced, as required	-	-	-	-
PC16. maintain records of workplace emergencies and report them to the relevant authority in compliance with the applicable regulatory requirements	-	-	-	-
NOS Total	**40**	**60**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N9003
NOS Name	Manage health and safety at the workplace
Sector	Construction
Sub-Sector	Generic
Occupation	Generic Safety
NSQF Level	5
Credits	1
Version	1.0
Last Reviewed Date	31/08/2023
Next Review Date	31/08/2026
NSQC Clearance Date	31/08/2023

DGT/VSQ/N0103: Employability Skills (90 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. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

PC5. follow environmentally sustainable practices

Becoming a Professional in the 21st Century

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

PC6. recognize the significance of 21st Century Skills for employment

PC7. 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

PC8. 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:

PC9. use basic English for everyday conversation in different contexts, in person and over the telephone

PC10. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC11. write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

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

PC12. identify career goals based on the skills, interests, knowledge, and personal attributes

PC13. 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:

PC14. follow verbal and non-verbal communication etiquette while communicating in professional and public settings

PC15. use active listening techniques for effective communication

PC16. communicate in writing using appropriate style and format based on formal or informal requirements

PC17. work collaboratively with others in a team

Diversity & Inclusion

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

PC18. communicate and behave appropriately with all genders and PwD

PC19. escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

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

PC20. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.

PC21. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook

PC22. identify common components of salary and compute income, expenses, taxes, investments etc

PC23. 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:

PC24. operate digital devices and use their features and applications securely and safely

PC25. 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.

PC26. display responsible online behaviour while using various social media platforms

PC27. create a personal email account, send and process received messages as per requirement

PC28. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications

PC29. utilize virtual collaboration tools to work effectively

Entrepreneurship

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

PC30. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

PC31. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC32. 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:

PC33. identify different types of customers and ways to communicate with them

PC34. identify and respond to customer requests and needs in a professional manner

PC35. use appropriate tools to collect customer feedback

PC36. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

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

PC37. create a professional Curriculum vitae (Résumé)

PC38. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC39. apply to identified job openings using offline /online methods as per requirement

PC40. answer questions politely, with clarity and confidence, during recruitment and selection

PC41. 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 and different learning and employability related portals

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

KU6. importance of career development and setting long- and short-term goals

KU7. about effective communication

KU8. POSH Act

KU9. Gender sensitivity and inclusivity

KU10. different types of financial institutes, products, and services

KU11. components of salary and how to compute income and expenditure

KU12. importance of maintaining safety and security in offline and online financial transactions

KU13. different legal rights and laws

KU14. different types of digital devices and the procedure to operate them safely and securely

KU15. how to create and operate an e- mail account

KU16. use applications such as word processors, spreadsheets etc.

KU17. how to identify business opportunities

KU18. types and needs of customers

KU19. how to apply for a job and prepare for an interview

KU20. 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
Introduction to Employability Skills	**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	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC4. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC5. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**1**	**3**	**-**	**-**
PC6. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC7. 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	-	-	-	-
PC8. adopt a continuous learning mindset for personal and professional development	-	-	-	-
Basic English Skills	**3**	**4**	**-**	**-**
PC9. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC11. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**
PC12. identify career goals based on the skills, interests, knowledge, and personal attributes	-	-	-	-
PC13. prepare a career development plan with short- and long-term goals	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC14. follow verbal and non-verbal communication etiquette while communicating in professional and public settings	-	-	-	-
PC15. use active listening techniques for effective communication	-	-	-	-
PC16. communicate in writing using appropriate style and format based on formal or informal requirements	-	-	-	-
PC17. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**1**	**-**	**-**
PC18. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC19. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC20. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.	-	-	-	-
PC21. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC23. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**5**	**-**	**-**
PC24. operate digital devices and use their features and applications securely and safely	-	-	-	-
PC25. 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.	-	-	-	-
PC26. display responsible online behaviour while using various social media platforms	-	-	-	-
PC27. create a personal email account, send and process received messages as per requirement	-	-	-	-
PC28. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications	-	-	-	-
PC29. utilize virtual collaboration tools to work effectively	-	-	-	-
Entrepreneurship	**2**	**3**	**-**	**-**
PC30. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC31. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC32. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC33. identify different types of customers and ways to communicate with them	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC34. identify and respond to customer requests and needs in a professional manner	-	-	-	-
PC35. use appropriate tools to collect customer feedback	-	-	-	-
PC36. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC37. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC38. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC39. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC40. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC41. 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/N0103
NOS Name	Employability Skills (90 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	5
Credits	3
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	08/05/2028
NSQC Clearance Date	08/05/2025

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)/ Elements 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/ Elements.

2. The assessment for the knowledge part will be based on knowledge bank of questions created by Assessment Bodies subject to approval by SSC

3. Individual assessment agencies will create unique question papers for knowledge/theory part for assessment of candidates as per assessment criteria given below

4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on assessment criteria.

5. The passing percentage for each QP will be 70%. To pass the Qualification Pack, every trainee should score a minimum of 70% individually in each NOS.

6. The Assessor shall check the final outcome of the practices while evaluating the steps performed to achieve the final outcome.

7. The trainee shall be provided with a chance to repeat the test to correct his procedures in case of improper performance, with a deduction of marks for each iteration.

8. After the certain number of iterations as decided by SSC the trainee is marked as fail, scoring zero marks for the procedure for the practical activity.

9. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack within the specified time frame set by SSC.

10. Minimum duration of Assessment of each QP shall be of 4hrs/trainee.

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
CON/N2108.Integrate IoT with 7D BIM operations	30	60	0	10	100	40
CON/N2109.Perform facility and asset management using 7D BIM	30	60	0	10	100	40
CON/N9003.Manage health and safety at the workplace	40	60	0	0	100	10
DGT/VSQ/N0103.Employability Skills (90 Hours)	20	30	-	-	50	10
Total	**120**	**210**	**0**	**20**	**350**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
BIM	Building Information Modeling
FM	Facility Management
PLPs	Project Lifecycle Phases
POE	Post-Occupancy Evaluations
QA	Quality Assurance
AIM	Asset Information Modeling
PIM	Project Information Modeling

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.

Organisational Context	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.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	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.
Electives	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.
Options	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.