

Model Curriculum

QP Name: BIM Designer – Interior Design and VR Integration

QP Code: CON/Q2101

Version: 1.0

NSQF Level: 6.0

Model Curriculum Version: 1.0

Construction Skill Development Council of India || Tower 4B, DLF Corporate Park, 201&, 202 4B, Mehrauli-Gurgaon Rd, DLF Phase 3, Gurugram, Haryana 122002





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Training Parameters

Sector	Construction
Sub-Sector	Real Estate and Infrastructure Construction
Occupation	Building Information Modeling (BIM)
Country	India
NSQF Level	6.0
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2142.9900
Minimum Educational Qualification and Experience	Pursuing first year of 2-year PG program after completing 3-year UG degree OR Completed 4-year UG program (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-year of experience in the relevant field)) OR Previous relevant Qualification of NSQF Level (5) with 3 Years of experience in the relevant field
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21 Years
Last Reviewed On	31/08/2023
Next Review Date	31/08/2026
NSQC Approval Date	31/08/2023
QP Version	1.0
Model Curriculum Creation Date	31/08/2023



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Model Curriculum Valid Up to Date	31/08/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	630 Hours
Maximum Duration of the Course	630 Hours





Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills to:

- Describe the process of carrying out interior designing using BIM tools.
- Explain the process of performing integration of VR with BIM.
- Explain the process of assisting in coordinating BIM designing.
- Explain the importance of work according to personal health, safety and environment protocols at construction sites.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration	
CON/N2110: Carry out interior designing using BIM tools NOS Version- 1.0 NSQF Level- 6.0	60:00	90:00	60:00	00:00	210:00	
Module 1: Introduction to the role of a BIM Designer – Interior Design and VR Integration	05:00	00:00	0:00	00:00	05:00	
Module 2: Process of carrying out interior designing using BIM tools	55:00	90:00	60:00	00:00	215:00	
CON/N2111: Perform integration of VR with BIM NOS Version- 1.0 NSQF Level- 6.0	30:00	60:00	30:00	00:00	120:00	
Module 3: Process of performing integration of VR with BIM	30:00	60:00	30:00	00:00	120:00	
CON/N2112: Assist in coordinating BIM designing NOS Version- 1.0 NSQF Level- 6.0	45:00	75:00	60:00	00:00	180:00	
Module 4: Process of assisting in coordinating BIM designing	45:00	75:00	60:00	00:00	180:00	







CON/N9003 Manage health and safety at the workplace NOS Version No. 1.0 NSQF Level -5	15:00	15:00	0:00	00:00	30:00
Module 5: Managing Health and Safety at the Workplace	15:00	15:00	0:00	00:00	30:00
DGT/VSQ/N0103: Employability Skills NOS Version- 1.0 NSQF Level- 5	90:00	00:00	0:00	00:00	90:00
Module 6: Employability Skills	90:00	00:00	0:00	00:00	90:00
Total Duration	240:00	240:00	150:00	00:00	630:00



Module Details

Module 1: Introduction to the role of a BIM Designer – Interior Design and VR Integration

Mapped to CON/N2110, v1.0

Terminal Outcomes:

• Discuss the job role of a BIM Designer – Interior Design and VR Integration.

Duration: 05:00	Duration: 0:00		
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes		
 Describe the size and scope of the construction industry and its subsectors. 			
 Discuss the role and responsibilities of a BIM Designer – Interior Design and VR Integration. 			
 Identify various employment opportunities for a BIM Designer – Interior Design and VR Integration. 			
Classroom Aids			
Training Kit - Trainer Guide, Presentations, White	board, Marker, Projector, Laptop, Video Films		
Tools, Equipment and Other Requirements			
NA			



Module 2: Process of carrying out Interior Designing using BIM Tools Mapped to CON/N2110, v1.0

Terminal Outcomes:

- Explain the process of designing the building's interiors.
- Describe the process of carrying out relevant documentation.

Duration: 55:00	Duration: 90:00			
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes			
 Explain the use of libraries of real-world materials, e.g. hardwood flooring, to create detailed representations and renderings. Elucidate the importance and process of creating a master schedule to predefine interior spaces in the building. Describe the process of detailing a building's interiors. Elucidate the importance and process of checking the interior design model against the design requirements. Explain how to calculate the interior area, quantify materials and produce estimates for the relevant interior designing materials. 	 Demonstrate the use of appropriate BIM software to visualise the interior design of the building, including lighting, materials, finishing and fixtures. Show how to generate rendered views with the required lighting conditions and finish/material representations directly from the BIM. Demonstrate the use of appropriate tools in the BIM software for interiors, e.g. tools for shaded views with vectorial shadows, capped section boxes and silhouette edges. Show how to generate photorealistic renderings using ray tracing or high-end radiosity techniques. Show how to create a master schedule to pre-define interior spaces in the building. Demonstrate the process of carrying out appropriate detailing for the building's interiors. Demonstrate the process of carrying out interior design-related documentation, including schedules, material take offs and other informational views of the building, presenting direct presentations of the underlying building model. 			

Classroom Aids

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop

Tools, Equipment and Other Requirements

Revit, AutoCAD, Navisworks, Desktop/Laptop





Module 3: Process of Performing Integration of VR with BIM Mapped to CON/N2111, v1.0

Terminal Outcomes:

- Explain the process of preparing for using VR.
- Describe the process of Use VR with BIM.

uration: 30:00	Duration: 60:00
heory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Explain the benefit of integrating VR with BIM, e.g. accuracy of BIM designs, reduction in project costs, enhanced efficiency and collaboration, etc.	• Demonstrate the process of setting up the VR software tools and devices for use as per the manufacturer's instructions.
 Explain the use of relevant software tools and devices for the implementation of VR in BIM designing. 	• Demonstrate the use of selected VR software tools and devices as per the manufacturers' instructions.
 Explain the use of Virtual reality to promote engagement with on-site personnel and stakeholders. 	 Show how to create virtual representations of construction projects with the help of VR.
 Elucidate how to create virtual models for BIM projects using VR technology. List the common problems encountered during the adoption of VR 	 Show how to use VR for pre- construction planning, e.g. checking site conditions or designing layouts. Demonstrate the process of performing
and how to resolve them.	minor troubleshooting for the VR device and coordinate with the manufacturer for the complex issues.
Classroom Aids	

Tools, Equipment and Other Requirements Revit, AutoCAD, Navisworks, Desktop/Laptop





Module 4: Process of Assisting in Coordinating BIM Designing Mapped to CON/N2112, v1.0

Terminal Outcomes:

• Explain the process of assisting in BIM software adoption and BIM modelling.

Duration: 45:00	Duration: 75:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
 Explain the benefit of using BIM for managing construction projects, e.g. real-time insights into project progress and cost. 	• Demonstrate how to conduct research concerning new software development and coordinate with the operations team for their implementation.
 Describe the building systems, specifications and construction methods. 	 Demonstrate how to conduct the appropriate test to assess the capabilities of relevant BIM software
 Describe BIM designing processes and standards. 	and make appropriate recommendations to the management.
 Explain the digital workflows in BIM designing. 	 Demonstrate the process of maintaining the BIM software document archives, standard details
 Explain the use of relevant BIM Authoring software. 	and families, and retrieve them for projects as required.
 Elucidate different stages of a BIM designing project lifecycle. 	 Show how to prepare and submit the weekly report on the BIM model
 Describe the process of modelling objects through specific applications. 	progress.
 Explain how to analyse the contents of information specifications and information management plans. 	
 Elucidate how to develop BIM models and conduct their pre-testing. 	
• Explain how to validate model objects information for consistency.	
• Explain the use of relevant software in the BIM supply chain.	
 Describe the process of document management. 	
 Explain how to import and export metadata from models into lifecycle management tools. 	
 Explain lifecycle management of BIM models. 	
• Describe the relevant industry	





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standards and codes.

- Explain the use of clash detection tools.
- Describe the process of creating 2D and 3D design models.
- Explain the use of the technical and operative documentation for the production of the composition and models.
- Describe the design process and principles for the production of precision technical documents, drawings and models.
- List the common training requirements of BIM modellers.
- Discuss the applicable safety working practices.

Classroom Aids

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop

Tools, Equipment and Other Requirements Revit, AutoCAD, Navisworks, Desktop/Laptop





Module 5: Managing Health and Safety at the Workplace Mapped to CON/N9003, v1.0

Terminal Outcomes:

- Explain the importance of ensuring health and safety at the workplace.
- Discuss how to manage workplace emergencies.
- Demonstrate the use of Personal Protective Equipment (PPE).

Duration: 15:00	Duration: 15:00		
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes		
• Explain the importance of health and safety at work.	• Demonstrate how to use the appropriate PPE according to the nature of work.		
 Discuss the regulations relevant to health and safety at work. 	 Demonstrate the use of relevant emergency equipment, e.g. use of fire 		
 Explain the selection of appropriate PPE according to the nature of work. 	extinguishers to extinguish different types of fire.		
 Discuss the importance of regular cleaning and sanitization at work. 	 Demonstrate how to provide first aid for different types of injuries or modical emergencies 		
 Explain the importance of regular workplace safety audits. 	medical emergencies.		
 Discuss the common health and safety hazards at the workplace and the appropriate preventive measures. 			
 Discuss the benefits of providing comprehensive training to personnel on emergency procedures. 			
 Explain the importance of the availability of an updated first-aid kit and functioning emergency equipment at work. 			
 Discuss the appropriate measures to be taken during different workplace emergencies. 			
 Explain the documentation and reporting requirements concerning workplace emergencies. 			

Training Kit - Trainer Guide, Projector/LED Monitor, Computer/ Laptop, Presentations, Black/ Whiteboard, Marker, Projector, Video

Tools, Equipment, and Other Requirements







Safety Gloves, Face Mask, Soap/ Hand Sanitizer, Safety goggles, Fire Extinguishers, Sand buckets, Fire prevention kit, First Aid box, Safety Tags, Safety Notice Board







Module 6: Employability Skills Mapped to DGT/VSQ/N0103, v1.0

Duration: 90:00

Key Learning Outcomes

Introduction to Employability Skills Duration: 3 Hours

After completing this programme, participants will be able to:

- 1. Outline the importance of Employability Skills for the current job market and future of work
- 2. List different learning and employability related GOI and private portals and their usage
- 3. Research and prepare a note on different industries, trends, required skills and the available opportunities

Constitutional values – Citizenship Duration: 1.5 Hours

- 4. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
- 5. Demonstrate how to practice different environmentally sustainable practices

Becoming a Professional in the 21st Century Duration: 5 Hours

- 6. Discuss relevant 21st century skills required for employment
- 7. Highlight the importance of practicing 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life
- 8. Create a pathway for adopting a continuous learning mindset for personal and professional development

Basic English Skills Duration: 10 Hours

- 9. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
- 10. Read and understand text written in basic English
- 11. Write a short note/paragraph / letter/e -mail using correct basic English

Career Development & Goal Setting Duration: 4 Hours

- 12. Create a career development plan
- 13. Identify well-defined short- and long-term goals

Communication Skills Duration: 10 Hours

- 14. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette
- 15. Write a brief note/paragraph on a familiar topic



- 16. Explain the importance of communication etiquette including active listening for effective communication
- 17. Role play a situation on how to work collaboratively with others in a team

Diversity and Inclusion Duration: 2.5 Hours

- 18. Demonstrate how to behave, communicate, and conduct appropriately with all genders and PwD
- 19. Discuss the significance of escalating sexual harassment issues as per POSH act

Financial and Legal Literacy Duration: 10 Hours

- 20. Discuss various financial institutions, products, and services
- 21. Demonstrate how to conduct offline and online financial transactions, safely and securely and check passbook/statement
- 22. Explain the common components of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), tax deductions
- 23. Calculate income and expenditure for budgeting
- 24. Discuss the legal rights, laws, and aids

Essential Digital Skills Duration: 20 Hours

- 25. Describe the role of digital technology in day-to-day life and the workplace
- 26. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
- 27. Demonstrate how to connect devices securely to internet using different means
- 28. Follow the dos and don'ts of cyber security to protect against cyber crimes
- 29. Discuss the significance of displaying responsible online behavior while using various social media platforms
- 30. Create an e-mail id and follow e- mail etiquette to exchange e -mails
- 31. Show how to create documents, spreadsheets and presentations using appropriate applications
- 32. utilize virtual collaboration tools to work effectively

Entrepreneurship Duration: 7 Hours

- 33. Explain the types of entrepreneurship and enterprises
- 34. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
- 35. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
- 36. Create a sample business plan, for the selected business opportunity

Customer Service Duration: 9 Hours

- 37. Classify different types of customers
- 38. Demonstrate how to identify customer needs and respond to them in a professional manner
- 39. Discuss various tools used to collect customer feedback
- 40. Discuss the significance of maintaining hygiene and dressing appropriately

Getting ready for apprenticeship & Jobs Duration: 8 Hours





- 41. Draft a professional Curriculum Vitae (CV)
- 42. Use various offline and online job search sources to find and apply for jobs
- 43. Discuss the significance of maintaining hygiene and dressing appropriately for an interview
- 44. Role play a mock interview
- 45. List the steps for searching and registering for apprenticeship opportunities





Module 7: On-the-Job Training

Mapped to BIM Designer – Interior Design and VR Integration

Mandatory Duration: 150:00	Recommended Duration: 00:00					
Location: On-Site						
Terminal Outcomes						
• Explain the process of detailing a building's	interiors.					
• Explain the use of relevant software tools a BIM designing.	and devices for the implementation of VR in					
 Use appropriate tools in the BIM software vectorial shadows, capped section boxes an 	for interiors, e.g. tools for shaded views with d silhouette edges.					
Generate photorealistic renderings using raytracing or high-end radiosity techniques.						
Create virtual representations of construction projects with the help of VR.						
 Conduct the appropriate test to assess the capabilities of relevant BIM software and make appropriate recommendations to the management. 						
Prepare and submit the weekly report on th	e BIM model progress.					





Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Specialization Educational		Relevant Industry Experience		Training Experience		Remarks
Qualification		Years	Specialization	Years	Specialization	
ITI/12th	Any domain	13	Building information modelling (BIM)	0	-	
Diploma in Engineering	Civil Engineering/ Mechanical Engineering/ Manufacturing/ Mathematics/ Physics degree	10	Building information modelling (BIM)	0	-	
Graduate	Civil Engineering/ Mechanical Engineering	8	Building information modelling (BIM)	0	-	

Trainer Certification				
Domain Certification	Platform Certification			
Certified for Job Role "BIM Designer – Interior Design and VR Integration", mapped to QP: "CON/Q2101, v1.0", Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Trainer (Vet and Skills)", mapped to the Qualification Pack: "MEP/Q2601, v2.0". The minimum accepted score as per MEPSC guidelines is 80%.			



Assessor Requirements

Assessor Prerequisites						
Minimum Educational	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
Qualification		Years	Specialization	Years	Specialization	
ITI/12th	Any domain	13	Building information modelling (BIM)	0	-	
Diploma in Engineering	Civil Engineering/ Mechanical Engineering/ Manufacturing/ Mathematics/ Physics degree	10	Building information modelling (BIM)	0	-	
Graduate	Civil Engineering/ Mechanical Engineering	8	Building information modelling (BIM)	0	-	

Assessor Certification				
Domain Certification	Platform Certification			
Certified for Job Role "BIM Designer – Interior Design and VR Integration", mapped to QP: "CON/Q2101, v1.0", Minimum accepted score is 80%	Certified for the Job Role: "Assessor (Vet and Skills)", mapped to the Qualification Pack: "MEP/Q2701, v2.0", with a minimum score of 80%.			





Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SIP
- The batch allocation Matrix prepared for each month based on previous months' performance of AAs, which determines the quantum of Assessment which can be allocated to each AA for a month
- Post allocation of assessment, Assessment agencies send the assessment confirmation to SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process. •

2. Testing Environment:

- A combination of Theory and practical/demonstration test is deployed to assess knowledge and Skill respectively of Learners.
- Assessment is conducted at Training center in in-person/offline mode
- For Skill assessment, environment is simulated to create a realistic Working Environment that should replicate the key features of the workplace. In job roles, where it is difficult to replicate the same, the OJT assessment is implemented.
- During the practical task, trainees are assessed on their workmanship, quality of finished product, time management, etc., based on the performance criteria (PC), knowledge and understanding and their professional and soft skills as specified in the qualification pack.
- Knowledge assessment is done through closed ended questions up to level 4 and from level 5 onwards, it is mixture of open ended and closed ended questions

3. Assessment Quality Assurance levels/Framework

- Assessment criteria is developed for each QP which acts as a guide for developing question set /banks
- Sample questions aligned with Assessment criteria for each QP are developed by SSC and validated by industry
- Taking reference of Assessment criteria and Sample Questions, AAs create the question bank • which is further validated by SSC
- Questions are mapped to the specified assessment criteria •
- It is mandatory that Assessor and Trainer must be ToA certified & ToT Certified respectively •
- Continuous Monitoring through virtual and In-person mode are conducted to ensure the • assessment is conducted as per stipulated process
- Process and Technical audit of assessment batches by quality team are conducted to avoid the errors in assessment process



- A well -defined comprehensive framework of NON-COMPLIANCE MATRIX is defined and implemented to identify the non-compliance made by assessor and AA and punitive actions are taken correspondingly.
- The capacity building sessions are conducted regularly for assessors and assessment agencies to update them about best practices in assessment

4. Types of evidence or evidence-gathering protocol:

- Post Assessment, the evidences are uploaded by Assessor to assessment agency and further assessment agency to SSC as per stipulated TAT
- Evidences are broadly the photographic and video graphic in nature
- Assessment agencies upload the evidence on SIP and detailed evidence on SSC digital platform (ZoHO)
- Evidences are; NOS wise-Geotagged photographs and videos of Theory Test & Practical Tasks, Attendance sheet, result summary sheet, group photographs.

5. Method of verification or validation:

- The process and technical audit of assessment batches are done by SSC
- Attendance of each candidate is verified and it is ensured that only those candidates are assessed by assessors who are meeting the stipulated minimum percentage of attendance
- The result of each candidate is verified, it is verified that that result on SIP are matching with respect to summary sheet submitted by AAs
- Under detailed technical audit for sample of batches, the knowledge and skill assessment results for each candidate is checked in technical aspect.
- All the evidences of batches are preserved on server of SSC digital platform

On the Job:

 On job training (OJT), candidates undergo training and leaning at actual workplace for a fixed period of time and a certain weightage of assessment is allocated out of total skill weightage of Qualification Pack for undergoing OJT as stipulated by CSDCI. This OJT score and assessors' end point score are combined to arrive at final Marking/grading of trainees' skill test. The OJT score is determined by Supervisor of company under which candidates undergo on job training.









References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
(M) TLO	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.







Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
CSDCI	Construction Skill development Council of India
MCQ	Multiple Choice Question
EHS	Environment Health and Safety