Qualification Pack

Technical artist -AR-VR

QP Code: MES/Q2505

Version: 1.0

NSQF Level: 5

Media & Entertainment Skills Council || Commercial premises No Ja522, 5th Floor, DLF Tower A, Jasola, New Delhi
110025

Contents

Qualification Pack

MES/Q2505: Technical artist -AR-VR

Brief Job Description

The individual in this job will act as an architecture and overlays AR-VR solution to deliver experience of their project vision to prospective users for analysis, learning and game development purpose. It articulates 3D content products for Virtual & Augmented Reality application with smart technology driven system (hardware) which brings realistic views to users.The Technical Artist also acts as bridge between the artists and programmers, ensuring the art content and features are easily integrated into the environment.

Personal Attributes

The person must be able to work under the Technical Lead supervision and must have the ability to plan and write original theme according to the guidelines provided. The role requires excellent communication skills and collaborative abilities. The AR /VR Developer must be structured and result oriented with focus on quality and deliverables.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. MES/N2514: Prepare model and complete the texture as per real-time engines requirement
2. MES/N2512: Test 3D models in the real-time/game environment as per design document
3. MES/N2513: Artificial intelligence and machine learning
4. MES/N2515: Deploy Internet of things (IoT)
5. MES/N2516: Enterprise block chain
6. MES/N2502: Prepare computer generated models
7. MES/N2517: Add textures to models
8. MES/N0104: Maintain Workplace Health & Safety

Qualification Pack (QP) Parameters

Sector	Media & Entertainment
Sub-Sector	Animation, Gaming

Qualification Pack

Occupation	Asset Creation
Country	India
NSQF Level	5
Credits	NA
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2166.0501
Minimum Educational Qualification & Experience	Graduate with 1 Year of experience OR 12th Class/Diploma with 3 Years of experience OR Certificate-NSQF (Certification as Animator / Modeller / Texturing Artist / Rigging Artist with two years of relevant experience) with 2 Years of experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	Acquaintance with any one High level Programming Language (Scripting languages)
Minimum Job Entry Age	21 Years
Last Reviewed On	30/12/2021
Next Review Date	29/12/2025
NSQC Approval Date	30/12/2021
Version	1.0
Reference code on NQR	2021/ME/MESC/04872
NQR Version	1.0

MES/N2514: Prepare model and complete the texture as per real-time engines requirement

Description

This unit covers understanding Augmented Reality, Principles and Techniques

Scope

The scope covers the following :

- This unit/task covers the following:
- Creation of models and texturing

Elements and Performance Criteria

Creation of models and texturing

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

PC1. analyse AR VR environments

PC2. scribe design specifications and enterprise system architecture

PC3. prepare digital models and asset content as per design specification

PC4. • use appropriate texturing and rendering systems to make displays as
• per design specification

PC5. identify and design components of model

PC6. create character design/frame and structure the character as model

PC7. create the visual style of the project, including colour sets, mood, etc.

PC8. add textures to models to create photo-realistic models

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the role and function of each member of the team.

KU2. • the creative vision of the art direction and the elements that need to
• be delivered to support the production

KU3. • how to study the project briefs and plan the work schedule
• accordingly.

KU4. tools used in the organisation for benefit of the pipline.

KU5. various AR VR platforms and their modelling requirements

KU6. various AR VR platforms and their texturing requirements

KU7. • how to produce various types of organic & inorganic models as per
• system architecture

KU8. • how to use LOD, Occlusion and other performance optimisation
• techniques supported on the platform

KU9. how to generate Low poly using high poly models to work within the ploycount

KU10. create and apply textures using digital painting tools

KU11. • use photographs and prepare textures for a model as color,
• reflection, normal and detail maps

KU12. • understand rendering systems such as PBR, Gaurd and work with
• various lighting models for realtime

Generic Skills (GS)

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

GS1. • take notes about application structuring and plan during project
• discussions with the Technical Lead.

GS2. document the model process and add notes to issues with span flow

GS3. read the requirement from the Scope of Work / design document.

GS4. • read and interpret developer guides, research documents, video and
• manuals of Realtime engine to identify and apply technique for
• execution.

GS5. • communicate technical suggestions and issues clearly using
• appropriate terminologies within a collaborative environment.

GS6. present/solicit feedback on work and identify modifications required.

GS7. • break tasks into work schedules and estimate the number of tasks
• required to complete the model

GS8. align the tasks with the project workflow

GS9. • have a keen eye for detail and maintain an aesthetic sense towards
• colour Shapes, forms and software capabilities of the final output

GS10. • handle technical issues such as pipeline concerns, optimizing
• efficiency of assets and asset integration in collaboration with peers

GS11. • evaluate the quality of model being implemented using established
• criteria and make improvements where required.

GS12. • make appropriate design to the team lead for problems related to
• detail of specific model.

GS13. • review work of self at every stage to ensure that he/she had meet
• the requirements laid out by the Design team.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Creation of models and texturing	**32**	**68**	**-**	**-**
PC1. analyse AR VR environments	3	7	-	-
PC2. scribe design specifications and enterprise system architecture	3	7	-	-
PC3. prepare digital models and asset content as per design specification	5	10	-	-
PC4. • use appropriate texturing and rendering systems to make displays as • per design specification	5	10	-	-
PC5. identify and design components of model	3	7	-	-
PC6. create character design/frame and structure the character as model	5	10	-	-
PC7. create the visual style of the project, including colour sets, mood, etc.	5	10	-	-
PC8. add textures to models to create photo-realistic models	3	7	-	-
NOS Total	**32**	**68**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	MES/N2514
NOS Name	Prepare model and complete the texture as per real-time engines requirement
Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Asset Creation
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	29/12/2025
NSQC Clearance Date	30/12/2021

MES/N2512: Test 3D models in the real-time/game environment as per design document

Description

This unit covers skills required to work with AR platforms, Principles Technology to test the model to be incorporated as game engine

Scope

The scope covers the following :

- This unit/task covers the following:
- Test model performance in game engine

Elements and Performance Criteria

Test model performance in game engine

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

PC1. use AR VR Development tools

PC2. understanding platform boundaries and optimisation techniques

PC3. integrate models in the AR VR Project

PC4. testing the models to ensure that they function correctly

PC5. test the models to ensure that they meet the design specifications

PC6. production requirements and function as required

PC7. • check the continuity of models, textures or paintings and make sure
• they are fit for purpose of for all required camera positions and angles

PC8. • evaluate the quality of the assets in relation to others within the
• same context in which they will be used

PC9. cororrect any problems or issues that may arise

PC10. • respond positively to feedback about work and changing textures/
• other requirements and make refinements as needed

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. tools, plugins & middleware available & used in the organisation.

KU2. Intellectual property rights copyright and fair use policies applicable to software and tools used in the organisation's business.

KU3. • the development practices to organize, label, structure and save the
• assets with versioning tools within the organization.

KU4. principles of real-time rendering

KU5. model setup and hierarchy to be followed in the system

KU6. import settings and import pipeline to be followed

KU7. organise materials for reuse so that batching is possible

KU8. assign textures and materials from existing models and pipeline

KU9. • select the right materials and shader inside the engine as per design
• specifications

KU10. set scale, size and proportions as per the design guide

KU11. execute the project and test for art errors

KU12. • understand vertex limitation and use LOD, Occlusion, Bitmap
• tethering, etc to optimise the scene

KU13. understand Normal, Detail, Reflection and other maps

KU14. work with lights, light probe and other environment settings

KU15. • post processing techniques to make the mode more appealing and
• pleasing to the product show

Generic Skills (GS)

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

GS1. • log and Report the progress of test tasks conducted in the model
• integration.

GS2. • read and interpret developer guides and manuals of game engine,
• development tools and other libraries to work with guidance on the
• rendering implementation

GS3. • identify and deliberate possible idea for architecture and framework
• implementation with the lead artist.

GS4. • communicate ideas, suggestions and issues relating to Tools and
• Technology used in development using appropriate terminologies
• within a collaborative environment

GS5. present/solicit feedback on work and identify modifications required.

GS6. • plan the implementation of test cases that is assigned to meet agreed
• work deliverables.

GS7. • organise and follow project file organisation, structure and
• integration with the base code efficiently.

GS8. • ideate and balance optimisation with beautification through an
• iterative process

GS9. • solve pipeline rendering issues related to the real-time assets and
• other artefacts related to assets

GS10. • provide constructive feedback to the team for improvement when
• necessary.

GS11. • make well informed and appropriate choices of sampling and
• synthesis techniques based on available resources.

GS12. • ensure that art and assets adhere fully to the creative and technical
• direction provided by the designer.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Test model performance in game engine	**36**	**64**	**-**	**-**
PC1. use AR VR Development tools	3	7	-	-
PC2. understanding platform boundaries and optimisation techniques	3	7	-	-
PC3. integrate models in the AR VR Project	5	10	-	-
PC4. testing the models to ensure that they function correctly	5	10	-	-
PC5. test the models to ensure that they meet the design specifications	3	5	-	-
PC6. production requirements and function as required	5	5	-	-
PC7. • check the continuity of models, textures or paintings and make sure • they are fit for purpose of for all required camera positions and angles	3	5	-	-
PC8. • evaluate the quality of the assets in relation to others within the • same context in which they will be used	3	5	-	-
PC9. cororrect any problems or issues that may arise	3	5	-	-
PC10. • respond positively to feedback about work and changing textures/ • other requirements and make refinements as needed	3	5	-	-
NOS Total	**36**	**64**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	MES/N2512
NOS Name	Test 3D models in the real-time/game environment as per design document
Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Asset Creation
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	29/12/2025
NSQC Clearance Date	30/12/2021

MES/N2513: Artificial intelligence and machine learning

Description

This Unit covers the knowledge required to use artificial intelligence and machine learning.

Scope

The scope covers the following :

- This unit/task covers the following:
- Apply Python for data science
- Artificial intelligence
- Ethics and Law in data and analysis
- Compute vision and image analysis

Elements and Performance Criteria

Apply Python for data science

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

PC1. identify application of pythons in work environment and its process

PC2. • editing python using IDE (Integrated development environments) and • text editors.

PC3. create python list

PC4. • apply python in developing 2D or 3D games, web & internet • development, database access, network programming and business • application.

PC5. • create Numpy and use large collection of high-level mathematical • functions

PC6. apply matplotlib

PC7. • apply mathematical rule: equations, functions and graphs; • differentiation and optimization, vector and matrices, statistics and • probability

PC8. explore data for machine learning

PC9. prepare data and clean data

Apply Python for data science

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

PC10. foundation of Artificial Intelligence (AI) in machine learning

PC11. recognise languages – computer vision

PC12. convert Bots as platform

PC13. detect digits in hand-written digit image

PC14. build a model to forecast a time data using a recurrent network

PC15. • build text data application using recurrent LSTM (long short term • memory)

PC16. Create neural models for machine translation and conversion

PC17. create multimodel intelligence using languages

PC18. recognise speech using basic signal processing

PC19. Create acoustic model and labelling

PC20. Decoding acoustic features into speech

Ethics and Law in data and analysis

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

PC21. apply ethical and legal framework for the data profession

PC22. • approach to data and analytics problems including big data, data
• science and AI

PC23. apply data methods for ethical and legal work in Analytics and AI

PC24. apply dynamic programming

Compute vision and image analysis

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

PC25. explore, manipulate and analyse images using python packages for computer vision

PC26. • implement image classification using classical machine learning and
• deep learning techniques.

PC27. use data augmentation and transfer learning to create highly effective convolutional neural networks (CNNs)

PC28. • classify images to use object detection and semantic segmentation
• models. approach to data and analytics problems including big data,
• data science and AI

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. • how to prepare for and contribute to the production processes and
• meetings.

KU2. roles and responsibilities of the Developer.

KU3. technical parameters and operational settings of the version control.

KU4. operations and techniques of the tool.

KU5. • technical specifications and operational limitations of version
• control.

Generic Skills (GS)

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

GS1. make detailed notes and comments while commit in version control

GS2. use proper naming conventions in the code and assets

GS3. properly arrange code and assets in folder structure.

GS4. read the comments on the previous commits

GS5. read the revision changes

GS6. • read the changes while comparing current project scripts with the
• committed scripts

GS7. give clear instructions and feedback while using version control.

GS8. plan timely lock and commit in order to meet agreed deliverables.

GS9. • organise the work of self and of the programming team according to
• the agreed schedule.

GS10. • analyse the stylistic characteristics to choose the most appropriate
• programming and sequencing techniques.

GS11. guide the team to resolve any technical or creative challenges associated with programming.

GS12. • address any potential delays or schedule conflicts adequately to
• minimize its impact on agreed deliverables.

GS13. • assess the quality of committed content using established criteria to
• ensure that they meet agreed quality standards.

GS14. suggest corrective actions where necessary to enhance the quality.

GS15. • determine the how often to commit and when to commit and
• checkout.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Apply Python for data science	**9**	**22**	**-**	**-**
PC1. identify application of pythons in work environment and its process	1	2	-	-
PC2. • editing python using IDE (Integrated development environments) and • text editors.	1	2	-	-
PC3. create python list	1	2	-	-
PC4. • apply python in developing 2D or 3D games, web & internet • development, database access, network programming and business • application.	1	2	-	-
PC5. • create Numpy and use large collection of high-level mathematical • functions	1	2	-	-
PC6. apply matplotlib	1	4	-	-
PC7. • apply mathematical rule: equations, functions and graphs; • differentiation and optimization, vector and matrices, statistics and • probability	1	4	-	-
PC8. explore data for machine learning	1	2	-	-
PC9. prepare data and clean data	1	2	-	-
Apply Python for data science	**11**	**26**	**-**	**-**
PC10. foundation of Artificial Intelligence (AI) in machine learning	1	2	-	-
PC11. recognise languages – computer vision	1	2	-	-
PC12. convert Bots as platform	1	2	-	-
PC13. detect digits in hand-written digit image	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. build a model to forecast a time data using a recurrent network	1	2	-	-
PC15. • build text data application using recurrent LSTM (long short term • memory)	1	4	-	-
PC16. Create neural models for machine translation and conversion	1	2	-	-
PC17. create multimodel intelligence using languages	1	4	-	-
PC18. recognise speech using basic signal processing	1	2	-	-
PC19. Create acoustic model and labelling	1	2	-	-
PC20. Decoding acoustic features into speech	1	2	-	-
Ethics and Law in data and analysis	**4**	**14**	**-**	**-**
PC21. apply ethical and legal framework for the data profession	1	4	-	-
PC22. • approach to data and analytics problems including big data, data • science and AI	1	2	-	-
PC23. apply data methods for ethical and legal work in Analytics and AI	1	4	-	-
PC24. apply dynamic programming	1	4	-	-
Compute vision and image analysis	**4**	**10**	**-**	**-**
PC25. explore, manipulate and analyse images using python packages for computer vision	1	4	-	-
PC26. • implement image classification using classical machine learning and • deep learning techniques.	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC27. use data augmentation and transfer learning to create highly effective convolutional neural networks (CNNs)	1	2	-	-
PC28. • classify images to use object detection and semantic segmentation • models. approach to data and analytics problems including big data, • data science and AI	1	2	-	-
NOS Total	**28**	**72**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	MES/N2513
NOS Name	Artificial intelligence and machine learning
Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Asset Creation
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	30/12/2026
NSQC Clearance Date	30/12/2021

MES/N2515: Deploy Internet of things (IoT)

Description

This unit covers the uses of system of interrelated computing devices, mechanical and digital machines provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

Scope

The scope covers the following :

- This unit/task covers the following:
- IoT solutions
- Customize the remote monitoring solutions
- Digital transformation with IoT
- Device management

Elements and Performance Criteria

• IoT solutions

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

PC1. interpret IoT solution for dummies

PC2. apply principles to follow for a successful deployment

PC3. analyse IoT connectivity and related technologies

PC4. select a board for prototyping

PC5. analyse digital signage solutions for windows IoT platform

PC6. run environment locally

PC7. apply IoT Central, maps and an IoT SaaS solution

Customize the remote monitoring solutions

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

PC8. customize UX and redeploy a microservice

PC9. integrate with visualization tools

PC10. use IoT Hub and connect MX Chip

PC11. connect a Pi simulator to IoT Hub

PC12. visualize time-series data with Time Series Insights

PC13. react to critical device lifecycle events and trigger Actions

PC14. cold path storage and hot path analytics

PC15. • load test using Device Simulator and configure and monitor IoT
• devices at scale

PC16. Customize the Remote Monitoring solution accelerator

Digital transformation with IoT

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

PC17. host IoT solution accelerator
PC18. scale IoT solution, IoT data and extract insights
PC19. explore Edge intelligence in a Connected Factory
PC20. sequence IoT Hub primitives and Hub messaging

Device management

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

PC21. host device management with IoT Hub and primitives
PC22. examine automatic device management
PC23. use IoT SDKs and developer tools
PC24. analyse Hub device provisioning service

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. • how to prepare for and contribute to the production processes and
• meetings.
KU2. roles and responsibilities of the Developer.
KU3. technical parameters and operational settings of the version control.
KU4. operations and techniques of the tool.
KU5. • technical specifications and operational limitations of version
• control.

Generic Skills (GS)

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

GS1. make detailed notes and comments while commit in version control
GS2. use proper naming conventions in the code and assets
GS3. technical parameters and operational settings of the version control.
GS4. operations and techniques of the tool.
GS5. • technical specifications and operational limitations of version
• control.
GS6. make detailed notes and comments while commit in version control
GS7. use proper naming conventions in the code and assets
GS8. properly arrange code and assets in folder structure
GS9. read the comments on the previous commits
GS10. read the revision changes
GS11. • read the changes while comparing current project scripts with the
• committed scripts
GS12. give clear instructions and feedback while using version control
GS13. plan timely lock and commit in order to meet agreed deliverables

GS14. • organise the work of self and of the programming team according to
• the agreed schedule

GS15. • analyse the stylistic characteristics to choose the most appropriate
• programming and sequencing techniques

GS16. • guide the team to resolve any technical or creative challenges
• associated with programming

GS17. • address any potential delays or schedule conflicts adequately to
• minimize its impact on agreed deliverables

GS18. • assess the quality of committed content using established criteria to
• ensure that they meet agreed quality standards.

GS19. suggest corrective actions where necessary to enhance the quality.

GS20. • determine the how often to commit and when to commit and
• checkout.

GS21. review the work output at every stage.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
• IoT solutions	**7**	**22**	**-**	**-**
PC1. interpret IoT solution for dummies	1	2	-	-
PC2. apply principles to follow for a successful deployment	1	2	-	-
PC3. analyse IoT connectivity and related technologies	1	2	-	-
PC4. select a board for prototyping	1	4	-	-
PC5. analyse digital signage solutions for windows IoT platform	1	4	-	-
PC6. run environment locally	1	4	-	-
PC7. apply IoT Central, maps and an IoT SaaS solution	1	4	-	-
Customize the remote monitoring solutions	**9**	**30**	**-**	**-**
PC8. customize UX and redeploy a microservice	1	2	-	-
PC9. integrate with visualization tools	1	4	-	-
PC10. use IoT Hub and connect MX Chip	1	4	-	-
PC11. connect a Pi simulator to IoT Hub	1	4	-	-
PC12. visualize time-series data with Time Series Insights	1	4	-	-
PC13. react to critical device lifecycle events and trigger Actions	1	4	-	-
PC14. cold path storage and hot path analytics	1	2	-	-
PC15. • load test using Device Simulator and configure and monitor IoT • devices at scale	1	4	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. Customize the Remote Monitoring solution accelerator	1	2	-	-
Digital transformation with IoT	**4**	**10**	**-**	**-**
PC17. host IoT solution accelerator	1	4	-	-
PC18. scale IoT solution, IoT data and extract insights	1	2	-	-
PC19. explore Edge intelligence in a Connected Factory	1	2	-	-
PC20. sequence IoT Hub primitives and Hub messaging	1	2	-	-
Device management	**4**	**14**	**-**	**-**
PC21. host device management with IoT Hub and primitives	1	4	-	-
PC22. examine automatic device management	1	2	-	-
PC23. use IoT SDKs and developer tools	1	4	-	-
PC24. analyse Hub device provisioning service	1	4	-	-
NOS Total	**24**	**76**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	MES/N2515
NOS Name	Deploy Internet of things (IoT)
Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Asset Creation
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	30/12/2026
NSQC Clearance Date	30/12/2021

MES/N2516: Enterprise block chain

Description

This unit covers the uses cryptography to add a layer of security to the data stored on the network.

Scope

The scope covers the following :

- This unit/task covers the following:
- Foundation of block chain and its application
- Configuration of hyperledger fabric

Elements and Performance Criteria

Foundation of block chain and its application

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

PC1. interpret block chain concept

PC2. cryptocurrencies and risks

PC3. consensus alogrithms

PC4. transact block chain

PC5. synergy of blockchain with other cutting edge technologies

PC6. design block chain

PC7. analyse ethereum

PC8. design network structure of ethereum

PC9. installation of toolchain

PC10. setting up private node

Configuration of hyperledger fabric

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

PC11. building blocks of blockchain solutions

PC12. architect HLF runtime

PC13. installation of Hyperledger fabric

PC14. configure Hyperledger Fabric

PC15. analyse the role of System components

PC16. • use-Case Introduction and create Hyperledger Fabric Blockchain
• network

PC17. implement Smart Contract / Chaincode

PC18. install and Instantiate chaincode

PC19. deploy Client Application (DApp)

PC20. communicate Transport Layer Security (TLS)

PC21. architect security, threat and mitigation

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. • how to prepare for and contribute to the production processes and
• meetings.

KU2. roles and responsibilities of the Developer.

KU3. technical parameters and operational settings of the version control.

KU4. operations and techniques of the tool.

KU5. • technical specifications and operational limitations of version
• control.

Generic Skills (GS)

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

GS1. make detailed notes and comments while commit in version control

GS2. use proper naming conventions in the code and assets

GS3. properly arrange code and assets in folder structure

GS4. read the comments on the previous commits

GS5. read the revision changes

GS6. • read the changes while comparing current project scripts with the
• committed scripts

GS7. give clear instructions and feedback while using version control

GS8. plan timely lock and commit in order to meet agreed deliverables.

GS9. • organise the work of self and of the programming team according to
• the agreed schedule.

GS10. • analyse the stylistic characteristics to choose the most appropriate
• programming and sequencing techniques.

GS11. review the work output at every stage.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Foundation of block chain and its application	**11**	**34**	**-**	**-**
PC1. interpret block chain concept	1	2	-	-
PC2. cryptocurrencies and risks	2	2	-	-
PC3. consensus alogrithms	1	2	-	-
PC4. transact block chain	1	4	-	-
PC5. synergy of blockchain with other cutting edge technologies	1	4	-	-
PC6. design block chain	1	4	-	-
PC7. analyse ethereum	1	4	-	-
PC8. design network structure of ethereum	1	4	-	-
PC9. installation of toolchain	1	4	-	-
PC10. setting up private node	1	4	-	-
Configuration of hyperledger fabric	**19**	**36**	**-**	**-**
PC11. building blocks of blockchain solutions	1	4	-	-
PC12. architect HLF runtime	1	4	-	-
PC13. installation of Hyperledger fabric	1	4	-	-
PC14. configure Hyperledger Fabric	2	3	-	-
PC15. analyse the role of System components	2	3	-	-
PC16. • use-Case Introduction and create Hyperledger Fabric Blockchain • network	2	3	-	-
PC17. implement Smart Contract / Chaincode	2	3	-	-
PC18. install and Instantiate chaincode	2	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC19. deploy Client Application (DApp)	2	3	-	-
PC20. communicate Transport Layer Security (TLS)	2	3	-	-
PC21. architect security, threat and mitigation	2	3	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	MES/N2516
NOS Name	Enterprise block chain
Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Asset Creation
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	30/12/2026
NSQC Clearance Date	30/12/2021

MES/N2502: Prepare computer generated models

Description

This OS unit is about creating computer generated models for the animation process

Elements and Performance Criteria

Preparation of computer generated 3D models

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

PC1. prepare digital models according to the design brief, requirements, specifications and technical needs of the project specified by the art director/ character designers

PC2. create prototypes/pilots for testing

PC3. understand the final display medium and adapt / suggest the model for its polycounts, mesh complexity, movement capability etc. under supervision of the art director and character designers

PC4. ensure that the models will be able to perform properly once animated, are uniform and consistent and are delivered in appropriate formats that can be used by others

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the creative vision and elements of production relevant to his/her job role

KU2. the pipeline/schedule and timelines relevant to their work

KU3. the intended purpose/ end-use of the models that need to be created

KU4. principles of 3D modeling and animation including concepts like polygons, nurbs, and sub surface modeling etc.

KU5. human anatomy, skeleton structure, joints, facial muscles etc.

KU6. human mannerisms, emotions, behavior, facial expressions etc.

KU7. basics of rigging to help build models with the minimum necessary spline, nurbs and polygons

KU8. techniques and workflow of UV mapping

KU9. principles of engineering

KU10. physics of motion, resistance and volume

KU11. form, scale and proportion of various models

KU12. the techniques of sculpting (added advantage)

KU13. drawing and illustration techniques

KU14. how to create various types of models (organic, non-organic, simple, complex)

KU15. how to use modelling software and tools such as Maya, 3D Studio Max, Blender, Mud-Box, Zbrush, Mari etc.

KU16. how to design and develop models consistent with the creative look of the production and in accordance to the script and design brief

KU17. how to build models with the necessary detailing and as per the camera distance

KU18. the sources for research and reference material

KU19. how to design models to suit the final use. e.g. a model created for feature films is different from model created for television series and it is further different from model created for a game or e-learning module

KU20. how to test models (through the basic phonemes test, basic expression test, simulation tests, grayscale turnarounds) to ensure that they meet the design specification and production requirements

KU21. how to test characters, props and environments to ensure they appear correctly from all required camera positions and angles

KU22. how to optimise mesh as per production requirements

KU23. applicable copyright norms and intellectual property rights

KU24. applicable health and safety guidelines

Generic Skills (GS)

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

GS1. document notes /draw illustrations to assist during the modelling process

GS2. read and understand the design brief and character pack

GS3. research links, videos, artwork etc. that can be used as references during the modelling process

GS4. understand the design brief and requirements from the art director and character designers

GS5. present the final character models to the art director and solicit feedback

GS6. breakup the tasks required and estimate the time required for each task, so as to manage own work in assigned time schedule

GS7. identify any creative problems that may arise during the production and work back with the art director and character designers to find suitable solutions to address them

GS8. have a keen eye for detail and maintain an aesthetic sense towards colour shapes, forms and software capabilities of the final output

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Preparation of computer generated 3D models	**40**	**60**	**-**	**-**
PC1. prepare digital models according to the design brief, requirements, specifications and technical needs of the project specified by the art director/ character designers	10	15	-	-
PC2. create prototypes/pilots for testing	10	15	-	-
PC3. understand the final display medium and adapt / suggest the model for its polycounts, mesh complexity, movement capability etc. under supervision of the art director and character designers	10	15	-	-
PC4. ensure that the models will be able to perform properly once animated, are uniform and consistent and are delivered in appropriate formats that can be used by others	10	15	-	-
NOS Total	**40**	**60**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	MES/N2502
NOS Name	Prepare computer generated models
Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Asset Creation
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	27/01/2027
NSQC Clearance Date	27/01/2022

MES/N2517: Add textures to models

Description

This OS unit is about creating and adding textures to models to create precise photorealistic models that can be used for animation under close supervision of a senior.

Scope

The scope covers the following :

- This unit/task covers the following:
- Creation of textures (Character and features - human, animal, character,
- location, set and props which may include organic and inorganic surfaces such
- as: Bones, wrinkles, bricks, ground, rust, wood, tiles, plastic, paper, metal,
- food, water, fire, skin, hair and eyes, cloth, walls and ceiling, imaginary)

Elements and Performance Criteria

Creation of textures

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

PC1. • determine possibilities for adding textures to models to create photo-realistic
• models/images

PC2. • develop and add textures to models in accordance to the design brief and
• concept art for different types of models under the supervision of the art
• director and character artist

PC3. analyse the final exhibition medium and adapt the textures accordingly

PC4. • manage quality of textures during the animation process and ensure
• uniformity and consistency in the final output

PC5. • deliver project in appropriate formats that can be used by others in the
• pipeline

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. The creative vision and elements of production relevant to his/her job role

KU2. The production pipeline/schedule and timelines relevant to their work

KU3. The medium on which the product will be exhibited

KU4. • The principles of Colour theory and ways in which it can be explored to meet
• the needs of the production

KU5. • Lighting properties and concepts like three point lighting, Blinn, Lambert,
• transparency, self-illumination, glow, bump, displacement, reflection,
• refraction etc.

KU6. Techniques and workflow of UV mapping

KU7. Techniques of texture mapping, projection and managing texture seams

KU8. Techniques of drawing, painting and sculpting

KU9. Fundamentals of photography/lighting (would be an added advantage)

KU10. How to apply colour effects such as colour tones, textures, matte etc.

KU11. • Properties of different types of surfaces such as wood, glass, plastic, leather,
• metal etc. and native materials for rendering (for Vray, MentalRay etc.)

KU12. How different types of surfaces react to varying lighting conditions

KU13. • How to work on software such as Autodesk Maya, Photoshop, 3D Studio Max,
• Blender, Mud Box, Zbrush, Mari, Renderman Shader scripting etc. and render
• plug-ins like renderman, air, vray etc.

KU14. • How to create photo-realistic textures consistent with the creative look of the
• production and in accordance to the design brief

KU15. • How to test the textures using light reaction turnarounds tests, location study
• of the environment etc.

KU16. How to optimise or enhance textures as per the needs of production

KU17. • The basics of modeling to understand the surface flow and create textures
• without stretching

KU18. Fundamentals of scripting (added advantage)

KU19. The sources for research and reference material

KU20. Applicable copyright norms and intellectual property rights

Generic Skills (GS)

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

GS1. • Document notes on the texture specifications to be complied with during the
• texturing process

GS2. Keep apprised of the techniques applied by other artists to create photorealistic textures

GS3. Gather references and drawings to compare with real-life textures

GS4. • Understand the design brief and textures that need to be created from the
• Art Director

GS5. • Collaborate with lighting artists and compositors to ensure that the final
• product matches quality standards

GS6. Present the textured models to the Art Director and solicit feedback

GS7. • Plan and prioritise own work according to the requirements and agreed
• timelines

GS8. • Handle technical issues such as pipeline concerns, optimizing efficiency of
• assets and asset integration in collaboration with peers and under supervision
• of the art director

GS9. • Have a keen eye for detail and maintain an aesthetic sense towards colour
• Shapes, forms and software capabilities of the final output

GS10. • Identify any creative problems that may arise during the production and work
• back with the art director and character designers to find suitable solutions to
• address them

GS11. Manage creative decisions as per the client inputs while texturing 3D models

GS12.
- Manage deadlines and revert on corrections or rework as per the client
- inputs/rigging/animation inputs while producing 3D textures

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Creation of textures	**25**	**75**	**-**	**-**
PC1. • determine possibilities for adding textures to models to create photo-realistic • models/images	5	15	-	-
PC2. • develop and add textures to models in accordance to the design brief and • concept art for different types of models under the supervision of the art • director and character artist	5	15	-	-
PC3. analyse the final exhibition medium and adapt the textures accordingly	5	15	-	-
PC4. • manage quality of textures during the animation process and ensure • uniformity and consistency in the final output	5	15	-	-
PC5. • deliver project in appropriate formats that can be used by others in the • pipeline	5	15	-	-
NOS Total	**25**	**75**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	MES/N2517
NOS Name	Add textures to models
Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Asset Creation
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	27/01/2027
NSQC Clearance Date	27/01/2022

MES/N0104: Maintain Workplace Health & Safety

Description

This OS unit is about contributing towards maintaining a healthy, safe and secure working environment

Elements and Performance Criteria

Understanding the health, safety and security risks prevalent in the workplace

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

PC1. understand and comply with the organizations current health, safety and security policies and procedures

PC2. understand the safe working practices pertaining to own occupation

PC3. understand the government norms and policies relating to health and safety including emergency procedures for illness, accidents, fires or others which may involve evacuation of the premises

PC4. participate in organization health and safety knowledge sessions and drills

Knowing the people responsible for health and safety and the resources available

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

PC5. identify the people responsible for health and safety in the workplace, including those to contact in case of an emergency

PC6. identify security signals e.g. fire alarms and places such as staircases, fire warden stations, first aid and medical rooms

Identifying and reporting risks

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

PC7. identify aspects of your workplace that could cause potential risk to own and others health and safety

PC8. ensure own personal health and safety, and that of others in the workplace though precautionary measures

PC9. identify and recommend opportunities for improving health, safety, and security to the designated person

PC10. report any hazards outside the individuals authority to the relevant person in line with organizational procedures and warn other people who may be affected

Complying with procedures in the event of an emergency

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

PC11. follow organizations emergency procedures for accidents, fires or any other natural calamity in case of a hazard

PC12. identify and correct risks like illness, accidents, fires or any other natural calamity safely and within the limits of individuals authority

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Organizations norms and policies relating to health and safety
KU2. Government norms and policies regarding health and safety and related emergency procedures
KU3. Limits of authority while dealing with risks/ hazards
KU4. The importance of maintaining high standards of health and safety at a workplace
KU5. The different types of health and safety hazards in a workplace
KU6. Safe working practices for own job role
KU7. Evacuation procedures and other arrangements for handling risks
KU8. Names and contact numbers of people responsible for health and safety in a workplace
KU9. How to summon medical assistance and the emergency services, where necessary
KU10. Vendors or manufacturers instructions for maintaining health and safety while using equipment, systems and/or machines

Generic Skills (GS)

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

GS1. how to write and provide feedback regarding health and safety to the concerned people
GS2. how to write and highlight potential risks or report a hazard to the concerned people
GS3. read instructions, policies, procedures and norms relating to health and safety
GS4. highlight potential risks and report hazards to the designated people
GS5. listen and communicate information with all anyone concerned or affected
GS6. make decisions on a suitable course of action or plan
GS7. plan and organize people and resources to deal with risks/ hazards that lie within the scope of ones individual authority
GS8. apply problem solving approaches in different situations
GS9. understand hazards that fall within the scope of individual authority and report all hazards that may supersede ones authority
GS10. apply balanced judgments in different situations
GS11. How to write and provide feedback regarding health and safety to the concerned people
GS12. How to write and highlight potential risks or report a hazard to the concerned people
GS13. Read instructions, policies, procedures and norms relating to health and safety
GS14. Highlight potential risks and report hazards to the designated people
GS15. Listen and communicate information with all anyone concerned or affected
GS16. Make decisions on a suitable course of action or plan
GS17. Plan and organize people and resources to deal with risks/ hazards that lie within the scope of ones individual authority
GS18. Apply problem solving approaches in different situations
GS19. build and maintain positive and effective relationships with colleges and customers
GS20. analyze data and activites
GS21. Understand hazards that fall within the scope of individual authority and report all hazards that may supersede ones authority

GS22. Apply balanced judgments in different situations

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Understanding the health, safety and security risks prevalent in the workplace	**15**	**15**	**-**	**-**
PC1. understand and comply with the organizations current health, safety and security policies and procedures	5	5	-	-
PC2. understand the safe working practices pertaining to own occupation	5	5	-	-
PC3. understand the government norms and policies relating to health and safety including emergency procedures for illness, accidents, fires or others which may involve evacuation of the premises	3	2	-	-
PC4. participate in organization health and safety knowledge sessions and drills	2	3	-	-
Knowing the people responsible for health and safety and the resources available	**10**	**10**	**-**	**-**
PC5. identify the people responsible for health and safety in the workplace, including those to contact in case of an emergency	5	5	-	-
PC6. identify security signals e.g. fire alarms and places such as staircases, fire warden stations, first aid and medical rooms	5	5	-	-
Identifying and reporting risks	**18**	**17**	**-**	**-**
PC7. identify aspects of your workplace that could cause potential risk to own and others health and safety	5	5	-	-
PC8. ensure own personal health and safety, and that of others in the workplace though precautionary measures	5	5	-	-
PC9. identify and recommend opportunities for improving health, safety, and security to the designated person	3	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. report any hazards outside the individuals authority to the relevant person in line with organizational procedures and warn other people who may be affected	5	5	-	-
Complying with procedures in the event of an emergency	**7**	**8**	**-**	**-**
PC11. follow organizations emergency procedures for accidents, fires or any other natural calamity in case of a hazard	5	5	-	-
PC12. identify and correct risks like illness, accidents, fires or any other natural calamity safely and within the limits of individuals authority	2	3	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	MES/N0104
NOS Name	Maintain Workplace Health & Safety
Sector	Media & Entertainment
Sub-Sector	Film, Television, Animation, Gaming, Radio, Advertising
Occupation	Ad sales/Account Management/Scheduling/Traffic
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	30/12/2021
Next Review Date	27/01/2027
NSQC Clearance Date	27/01/2022

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) 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. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student

at each examination/training centre based on this criterion.

6. To pass the Qualification Pack , every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.

7. 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
MES/N2514.Prepare model and complete the texture as per real-time engines requirement	32	68	-	-	100	15
MES/N2512.Test 3D models in the real-time/game environment as per design document	36	64	-	-	100	15
MES/N2513.Artificial intelligence and machine learning	28	72	-	-	100	15
MES/N2515.Deploy Internet of things (IoT)	24	76	-	-	100	10
MES/N2516.Enterprise block chain	30	70	-	-	100	15
MES/N2502.Prepare computer generated models	40	60	-	-	100	10
MES/N2517.Add textures to models	25	75	-	-	100	10
MES/N0104.Maintain Workplace Health & Safety	50	50	-	-	100	10

Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
Total	**265**	**535**	**-**	**-**	**800**	**100**

Acronyms

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

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.
Sector	Sector is a conglomeration of different business operations having similar businesses 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 they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance criteria are statements that together specify the standard of performance required when carrying out a task.

National Occupational Standard	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OSs, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
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.
Knowledge and Understanding	Knowledge and understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual need to perform to the required standard.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/Generic Skills	Core skills or generic skills are group of skills that are the key to learning and working in todays world.
Creative Brief	Creative brief is a document that captures the key questions that serve as a guide for the music arrangement including the vision, objective of the project, target audience, timelines, budgets, milestones, stakeholders etc.
Copyright Laws	A legal framework linked to intellectual property and the rights given to creators of original products/ concepts.
Script	Script is a structured narrative of a story and or the spoken word/ narrative that accompanies a programme.
AR-VR-MR	Augmented Reality Virtual reality Mixed Reality