

Qualification Pack



AR-VR Developer

Electives: AR Developer/ VR Developer

QP Code: MES/Q0509

Version: 1.0

NSQF Level: 6

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MES/Q0509: AR-VR Developer

Brief Job Description

Augmented Reality (AR) developers enhances the user experiences by overlaying digital information on top of the real world. The virtual reality designer develops virtual reality to simulate the user experiences and the complex object interactions or services with one another and with the user. The individual in this role is to works closely/ guide the various execution team, pre-production team, asset development team, technical team throughout the visualisation design and development process to ensure that the final product will accomplish the object of the project. AR/VR developers are responsible for putting the plan into action, which may include designing AR assets, along with providing support and ongoing maintenance for the user during project life cycle.

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 Developer must be structured and result oriented with focus on quality and deliverables.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [MES/N2513: Artificial intelligence and machine learning](#)
2. [MES/N2515: Deploy Internet of things \(IoT\)](#)
3. [MES/N2516: Enterprise block chain](#)
4. [MES/N0104: Maintain Workplace Health & Safety](#)
5. [MES/N2816: Perform code optimisation routines and use version control on code](#)

Electives(mandatory to select at least one):

Elective 1: AR Developer

Analyse concepts and characteristics of AR and Create AR application based on design

1. [MES/N0521: Analyse concepts and characteristics of AR](#)
2. [MES/N0522: Create AR application based on design](#)

Elective 2: VR Developer



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Analyse concept of VR technologies Develop VR application

1. [MES/N0523: Analyse concepts of VR Technologies](#)
2. [MES/N0524: Develop VR Application](#)

Qualification Pack (QP) Parameters

Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Art and Design
Country	India
NSQF Level	6
Credits	54
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2166.0501
Minimum Educational Qualification & Experience	Graduate (Pursuing Graduation (B. SC.Hons. / Specilization in Virtual / Augmented Reality)) with 2 Years of experience OR Diploma with 4 Years of experience OR 12th Class with 5 Years of experience
Minimum Level of Education for Training in School	Not Applicable
Pre-Requisite License or Training	Acquaintance with any one High level Programming Language (Scripting languages)
Minimum Job Entry Age	21 Years
Last Reviewed On	NA
Next Review Date	30/12/2026
NSQF Approval Date	30/12/2021
Version	1.0
Reference code on NQR	2021/ME/MESC/04873
NQR Version	1.0



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Remarks:

Nature of qualification is to teach AR/VR developing process, use of application in designing various module (animation, modelling, texturing and gaming) and purpose is to provide job and entrepreneurship/freelance opportunity as AR-VR Developer in M&E Industry. This qualification is for the training purpose for degree courses (university / colleges) as well as for Short Term Course



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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

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PC17. create multimodal 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



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- 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.

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Apply Python for data science</i>	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	-	-
<i>Apply Python for data science</i>	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	-	-

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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	-	-
<i>Ethics and Law in data and analysis</i>	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	-	-
<i>Compute vision and image analysis</i>	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	-	-



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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. <ul style="list-style-type: none"> • 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	-	-



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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



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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:

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- 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



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- 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.

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
• <i>IoT solutions</i>	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	-	-
<i>Customize the remote monitoring solutions</i>	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	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. Customize the Remote Monitoring solution accelerator	1	2	-	-
<i>Digital transformation with IoT</i>	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	-	-
<i>Device management</i>	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	-	-



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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
NSQF Clearance Date	30/12/2021



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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 algorithms
- 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



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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.

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Foundation of block chain and its application</i>	11	34	-	-
PC1. interpret block chain concept	1	2	-	-
PC2. cryptocurrencies and risks	2	2	-	-
PC3. consensus algorithms	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	-	-
<i>Configuration of hyperledger fabric</i>	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	-	-



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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	-	-



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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



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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 through 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:



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- 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 activities
- GS21.** Understand hazards that fall within the scope of individual authority and report all hazards that may supersede ones authority



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GS22. Apply balanced judgments in different situations

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Understanding the health, safety and security risks prevalent in the workplace</i>	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	-	-
<i>Knowing the people responsible for health and safety and the resources available</i>	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	-	-
<i>Identifying and reporting risks</i>	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 through precautionary measures	5	5	-	-
PC9. identify and recommend opportunities for improving health, safety, and security to the designated person	3	2	-	-

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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	-	-
<i>Complying with procedures in the event of an emergency</i>	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	-	-



Qualification Pack

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



Qualification Pack

MES/N2816: Perform code optimisation routines and use version control on code

Description

This Unit covers the code optimization routines, techniques and the use of version control on code.

Scope

The scope covers the following :

- Code Optimization Routines and Techniques
- Use of Version Control.

Elements and Performance Criteria

Code Optimization Routines, Techniques

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

- PC1.** Interpret Object-oriented programming concepts
- PC2.** use code to create symbol at adequate places
- PC3.** Apply code to develop and generate package of information
- PC4.** Analyse Software Design Patterns and the usage scenario
- PC5.** Uses optimization techniques like Batching, Pooling etc
- PC6.** Fix codes for various theme and application
- PC7.** run routine application and check sequences
- PC8.** Check and fix bugs if any

Use Version Control

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

- PC9.** Identify and handle version control tools
- PC10.** analyses and fixes timing to use version control
- PC11.** Construe to commit, checkout and revise code and assets

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)



Qualification Pack

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
- GS16.** review the work output at every stage

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Code Optimization Routines, Techniques</i>	23	57	-	-
PC1. Interpret Object-oriented programming concepts	3	7	-	-
PC2. use code to create symbol at adequate places	3	7	-	-
PC3. Apply code to develop and generate package of information	3	7	-	-
PC4. Analyse Software Design Patterns and the usage scenario	2	8	-	-
PC5. Uses optimization techniques like Batching, Pooling etc	3	7	-	-
PC6. Fix codes for various theme and application	3	7	-	-
PC7. run routine application and check sequences	3	7	-	-
PC8. Check and fix bugs if any	3	7	-	-
<i>Use Version Control</i>	7	13	-	-
PC9. Identify and handle version control tools	2	3	-	-
PC10. analyses and fixes timing to use version control	2	3	-	-
PC11. Construe to commit, checkout and revise code and assets	3	7	-	-
NOS Total	30	70	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MES/N2816
NOS Name	Perform code optimisation routines and use version control on code
Sector	Media & Entertainment
Sub-Sector	Animation, Gaming
Occupation	Production, Production
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	30/12/2026
NSQF Clearance Date	30/12/2021



Qualification Pack

MES/N0521: Analyse concepts and characteristics of AR

Description

This NOS covers skills required for creation of an AR Application -AR Principles, platforms and necessary tools.

Scope

The scope covers the following :

- Concept of AR Technologies
- AR Principles and logic implementation

Elements and Performance Criteria

Concept of AR Technology

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

- PC1.** Analyse Object-oriented programming concepts
- PC2.** Use of 3D data, images etc. for creating virtual data
- PC3.** Correlate with story outline
- PC4.** provide real time visualization and interaction within a virtual world
- PC5.** exploring and manipulating three-dimensional (3-D) interactive environment
- PC6.** Interpret Pseudocodes/Algorithms
- PC7.** Discuss and prepare flowcharts according to the Programming requirements.
- PC8.** Uses UML class structure diagrams.
- PC9.** Analyse existing code and understand its functionalities

AR Principles and logic implementation

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

- PC10.** Analyse and make necessary changes required for the target platform (combining it with AR)
- PC11.** Recreating the application using the core logic from the existing application
- PC12.** Explain Type of VR (Immersive VR, Desktop VR, Projection VR and Simulation VR) and its suitability as per target design
- PC13.** Act as visualization tools
- PC14.** Define target experience and the interaction of highlights
- PC15.** Formalize the experience(s) to implement
- PC16.** Present problems in a shared 3D environment that simulate real aspect of the real world
- PC17.** Provide unlimited number of viewpoints
- PC18.** Uses an existing code and its functionalities
- PC19.** measure the provided requirements and plan for enhancements without breaking existing functionalities
- PC20.** Enhance the application with modular functionalities.



Qualification Pack

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the role and function of each member of the programming team.
- KU2.** how to prepare for and contribute towards the production
- KU3.** the usage of tools like VCS, File Servers, Bug trackers, etc. in the organization
- KU4.** how to study the project briefs and plan the work Schedule accordingly.
- KU5.** how to apply object-oriented concepts to implement code
- KU6.** how to Implement Interaction system for the Application.
- KU7.** how to implement application logics
- KU8.** how to read and reuse existing code base
- KU9.** the usage of development tools like Game engine and middle ware
- KU10.** integration of Libraries and plugins with the application code.
- KU11.** how to use version control tools to maintain various versions of the code
- KU12.** performance optimization techniques

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.** write clean game play code with proper comments explaining application logic
- GS3.** write reports on the tasks being handled
- GS4.** read the requirement from the Scope of Work / design document
- GS5.** interpret and translate application requirements and guidelines to practical work setup
- GS6.** read and interpret developer guides and manuals of Realtime engine, development tools and other libraries
- GS7.** communicate technical suggestions and issues clearly using appropriate terminologies within a collaborative environment.
- GS8.** present/solicit feedback on work and identify modifications required.
- GS9.** plan programming templates, file organisation structure, and work timelines in order to meet agreed deliverables.
- GS10.** align the tasks with the project workflow
- GS11.** break down complex parts of the application module into manageable tasks
- GS12.** select and apply the right design patterns to solve the technical problems.
- GS13.** evaluate the quality of program being implemented using established criteria and make improvements where required.
- GS14.** Debug code to find and fix the bugs related to the project
- GS15.** make appropriate suggestion to the team lead for problems related to execution of specific application module.



Qualification Pack

GS16. review work of self at every stage to ensure that he/she had meet the requirements laid out by the Technical lead.

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Concept of AR Technology</i>	18	27	-	-
PC1. Analyse Object-oriented programming concepts	2	3	-	-
PC2. Use of 3D data, images etc. for creating virtual data	2	3	-	-
PC3. Correlate with story outline	2	3	-	-
PC4. provide real time visualization and interaction within a virtual world	2	3	-	-
PC5. exploring and manipulating three-dimensional (3-D) interactive environment	2	3	-	-
PC6. Interpret Pseudocodes/Algorithms	2	3	-	-
PC7. Discuss and prepare flowcharts according to the Programming requirements.	2	3	-	-
PC8. Uses UML class structure diagrams.	2	3	-	-
PC9. Analyse existing code and understand its functionalities	2	3	-	-
<i>AR Principles and logic implementation</i>	22	33	-	-
PC10. Analyse and make necessary changes required for the target platform (combining it with AR)	2	3	-	-
PC11. Recreating the application using the core logic from the existing application	2	3	-	-
PC12. Explain Type of VR (Immersive VR, Desktop VR, Projection VR and Simulation VR) and its suitability as per target design	2	3	-	-
PC13. Act as visualization tools	2	3	-	-
PC14. Define target experience and the interaction of highlights	2	3	-	-
PC15. Formalize the experience(s) to implement	2	3	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. Present problems in a shared 3D environment that simulate real aspect of the real world	2	3	-	-
PC17. Provide unlimited number of viewpoints	2	3	-	-
PC18. Uses an existing code and its functionalities	2	3	-	-
PC19. measure the provided requirements and plan for enhancements without breaking existing functionalities	2	3	-	-
PC20. Enhance the application with modular functionalities.	2	3	-	-
NOS Total	40	60	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MES/N0521
NOS Name	Analyse concepts and characteristics of AR
Sector	Media & Entertainment
Sub-Sector	Gaming
Occupation	Art and Design
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	30/12/2026
NSQC Clearance Date	30/12/2021



Qualification Pack

MES/N0522: Create AR application based on design

Description

This NOS covers skills required to create AR application as per design specification using development tools

Scope

The scope covers the following :

- Design AR Concept
- Arrange dataset layers

Elements and Performance Criteria

Concept of AR Technology

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

- PC1.** Analyse story about existing data or information
- PC2.** Overlay information on top of pre-existing data
- PC3.** Define AR Symbols
- PC4.** Facilitate data and visualize concepts
- PC5.** Consider real world and interpret utilities around features
- PC6.** Prepare theme of real and virtual data
- PC7.** Design and develop AR Application in line with existing features / story or specifications
- PC8.** Describe image recognition and object recognition
- PC9.** Analyse various AR platforms

Arrange dataset layers

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

- PC10.** Use SDK
- PC11.** Develop application for each AR platform with their specific SDKs
- PC12.** Create a cross platform AR application.
- PC13.** Construct user Realtime engine and create an AR Application
- PC14.** Combine layer of thematic data / information
- PC15.** Sequence the available data
- PC16.** Integration of assets into the application to demonstrate basic features

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** timelines available for plugin and Middleware.

Qualification Pack

- 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 code with versioning tools within the organization
- KU4.** principles of programming applicable in the application development process
- KU5.** how to model game elements with the required parameters and procedures matching the design specification.
- KU6.** integration of Art asset creations into the game according to the design guidelines laid out in Design Document.
- KU7.** implementation of various application subsystems in accordance with (as per) Design requirements
- KU8.** optimization techniques pertaining to application performance and size
- KU9.** how to Implement the User Interface as per Design specification laid out for User and Application information.
- KU10.** publishing techniques to convert a application across multiple platforms.

Generic Skills (GS)

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

- GS1.** make accurate notes about features to be implemented in the modules assigned by the lead programme
- GS2.** convert the features into task list and schedule a work plan
- GS3.** log and Report the progress of tasks completed with descriptions about feature being implemented.
- GS4.** read and Classify feature listing into Application Module.
- GS5.** read and Integrate Application programming interface (API) Documentation about Plugins and Libraries.
- GS6.** read and interpret developer guides and manuals of game engine, development tools and other libraries
- GS7.** identify and deliberate possible idea for architecture and framework implementation with the lead Programmer.
- GS8.** communicate ideas, suggestions and issues relating to Tools and Technology used in development using appropriate terminologies within a collaborative environment
- GS9.** present/solicit feedback on work and identify modifications required
- GS10.** plan the implementation of application module that is assigned to meet agreed work deliverables
- GS11.** plan project file organisation, structure and integration with the base code efficiently.
- GS12.** segregate the application modules implementation tasks required for the project into a manageable work breakdown structure for the team.
- GS13.** guide the team with methodical approaches to identify and resolve any technical issues that arise during sampling and synthesis.
- GS14.** provide constructive feedback to the team for improvement when necessary.



Qualification Pack

- GS15.** make well informed and appropriate choices of sampling and synthesis techniques based on available resources.
- GS16.** ensure that art and assets adhere fully to the creative and technical direction provided by the designer.

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Concept of AR Technology</i>	19	46	-	-
PC1. Analyse story about existing data or information	1	4	-	-
PC2. Overlay information on top of pre-existing data	1	4	-	-
PC3. Define AR Symbols	3	7	-	-
PC4. Facilitate data and visualize concepts	3	7	-	-
PC5. Consider real world and interpret utilities around features	3	7	-	-
PC6. Prepare theme of real and virtual data	3	7	-	-
PC7. Design and develop AR Application in line with existing features / story or specifications	2	3	-	-
PC8. Describe image recognition and object recognition	1	4	-	-
PC9. Analyse various AR platforms	2	3	-	-
<i>Arrange dataset layers</i>	12	23	-	-
PC10. Use SDK	2	3	-	-
PC11. Develop application for each AR platform with their specific SDKs	2	3	-	-
PC12. Create a cross platform AR application.	1	4	-	-
PC13. Construct user Realtime engine and create an AR Application	2	3	-	-
PC14. Combine layer of thematic data / information	2	3	-	-
PC15. Sequence the available data	2	3	-	-
PC16. Integration of assets into the application to demonstrate basic features	1	4	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	31	69	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MES/N0522
NOS Name	Create AR application based on design
Sector	Media & Entertainment
Sub-Sector	Gaming
Occupation	Art and Design
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	30/12/2026
NSQC Clearance Date	30/12/2021



Qualification Pack

MES/N0523: Analyse concepts of VR Technologies

Description

This NOS covers idea for basic preparation to create VR application from scratch, recreate an application, and make enhancements to an existing application.

Scope

The scope covers the following :

- Basic concept of VR Technologies
- Application of Virtual Reality

Elements and Performance Criteria

Basic concept of VR Technologies

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

- PC1.** Analyse Object-oriented programming concepts
- PC2.** Use of 3D data, images etc. for creating virtual data
- PC3.** Correlate with story outline
- PC4.** provide real time visualization and interaction within a virtual world
- PC5.** exploring and manipulating three-dimensional (3-D) interactive environment
- PC6.** Interpret Pseudocodes/Algorithms
- PC7.** Discuss and prepare flowcharts according to the Programming requirements.
- PC8.** Uses UML class structure diagrams.
- PC9.** Analyse existing code and understand its functionalities

Application of Virtual Reality

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

- PC10.** Analyse and make necessary changes required for the target platform (combining it with AR)
- PC11.** Recreating the application using the core logic from the existing application
- PC12.** Explain Type of VR (Immersive VR, Desktop VR, Projection VR and Simulation VR) and its suitability as per target design
- PC13.** Act as visualization tools
- PC14.** Define target experience and the interaction of highlights
- PC15.** Formalize the experience(s) to implement
- PC16.** Present problems in a shared 3D environment that simulate real aspect of the real world
- PC17.** Provide unlimited number of viewpoints
- PC18.** Uses an existing code and its functionalities
- PC19.** measure the provided requirements and plan for enhancements without breaking existing functionalities
- PC20.** Enhance the application with modular functionalities.



Qualification Pack

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the role and function of each member of the programming team.
- KU2.** how to prepare for and contribute towards the production
- KU3.** the usage of tools like VCS, File Servers, Bug trackers, etc. in the organization
- KU4.** how to study the project briefs and plan the work Schedule accordingly.
- KU5.** how to apply object-oriented concepts to implement code
- KU6.** how to Implement Interaction system for the Application.
- KU7.** how to implement application logics
- KU8.** how to read and reuse existing code base
- KU9.** the usage of development tools like Game engine and middle ware
- KU10.** integration of Libraries and plugins with the application code.
- KU11.** how to use version control tools to maintain various versions of the code
- KU12.** performance optimization techniques

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.** write clean game play code with proper comments explaining application logic
- GS3.** write reports on the tasks being handled
- GS4.** read the requirement from the Scope of Work / design document
- GS5.** interpret and translate application requirements and guidelines to practical work setup
- GS6.** read and interpret developer guides and manuals of Realtime engine, development tools and other libraries
- GS7.** communicate technical suggestions and issues clearly using appropriate terminologies within a collaborative environment.
- GS8.** present/solicit feedback on work and identify modifications required.
- GS9.** plan programming templates, file organisation structure, and work timelines in order to meet agreed deliverables.
- GS10.** align the tasks with the project workflow
- GS11.** break down complex parts of the application module into manageable tasks
- GS12.** select and apply the right design patterns to solve the technical problems.
- GS13.** evaluate the quality of program being implemented using established criteria and make improvements where required.
- GS14.** Debug code to find and fix the bugs related to the project
- GS15.** make appropriate suggestion to the team lead for problems related to execution of specific application module.



Qualification Pack

GS16. review work of self at every stage to ensure that he/she had meet the requirements laid out by the Technical lead.

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Basic concept of VR Technologies</i>	18	27	-	-
PC1. Analyse Object-oriented programming concepts	2	3	-	-
PC2. Use of 3D data, images etc. for creating virtual data	2	3	-	-
PC3. Correlate with story outline	2	3	-	-
PC4. provide real time visualization and interaction within a virtual world	2	3	-	-
PC5. exploring and manipulating three-dimensional (3-D) interactive environment	2	3	-	-
PC6. Interpret Pseudocodes/Algorithms	2	3	-	-
PC7. Discuss and prepare flowcharts according to the Programming requirements.	2	3	-	-
PC8. Uses UML class structure diagrams.	2	3	-	-
PC9. Analyse existing code and understand its functionalities	2	3	-	-
<i>Application of Virtual Reality</i>	22	33	-	-
PC10. Analyse and make necessary changes required for the target platform (combining it with AR)	2	3	-	-
PC11. Recreating the application using the core logic from the existing application	2	3	-	-
PC12. Explain Type of VR (Immersive VR, Desktop VR, Projection VR and Simulation VR) and its suitability as per target design	2	3	-	-
PC13. Act as visualization tools	2	3	-	-
PC14. Define target experience and the interaction of highlights	2	3	-	-
PC15. Formalize the experience(s) to implement	2	3	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. Present problems in a shared 3D environment that simulate real aspect of the real world	2	3	-	-
PC17. Provide unlimited number of viewpoints	2	3	-	-
PC18. Uses an existing code and its functionalities	2	3	-	-
PC19. measure the provided requirements and plan for enhancements without breaking existing functionalities	2	3	-	-
PC20. Enhance the application with modular functionalities.	2	3	-	-
NOS Total	40	60	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MES/N0523
NOS Name	Analyse concepts of VR Technologies
Sector	Media & Entertainment
Sub-Sector	Gaming
Occupation	Art and Design
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	30/12/2026
NSQC Clearance Date	30/12/2021



Qualification Pack

MES/N0524: Develop VR Application

Description

This NOS covers skills required to work with VR platforms, Principles Technology and the related development tools

Scope

The scope covers the following :

- Construct VR tools
- Develop VR models

Elements and Performance Criteria

Construct VR tools

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

- PC1.** Analyse Virtual Reality principles and basics
- PC2.** Analyse Virtual Reality principles and basics
- PC3.** Overlay (image, 2D, 3D) information on top of pre-existing data
- PC4.** Define VR catalogues
- PC5.** Facilitate data and visualize concepts
- PC6.** Researching and developing pipeline solutions and techniques
- PC7.** Consider real world and interpret utilities around features
- PC8.** Prepare theme of real and virtual data
- PC9.** Design and develop VR Application in line with existing features / story or specifications
- PC10.** Describe image recognition and object recognition
- PC11.** Production of VR/AR experiences viewable on mobile devices and VR headsets

Develop VR Models

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

- PC12.** Analyse different VR Platforms
- PC13.** Develop application for each VR platform with their specific SDKs
- PC14.** Working with pre-created images and 3D models to create photorealistic experiences
- PC15.** Spike testing and rapid proofing of concepts around emerging technologies
- PC16.** create rapid prototypes of systems in Unity, including asset integration into Unity
- PC17.** Building user interfaces in Unity utilizing diegetic, meta and spatial elements.
- PC18.** Spike testing and rapid proofing of concepts around emerging technologies.
- PC19.** Create a cross platform VR application
- PC20.** Integration of assets into the application to demonstrate basic features

Knowledge and Understanding (KU)

Qualification Pack

The individual on the job needs to know and understand:

- KU1.** timelines available for plugin and Middleware.
- 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 code with versioning tools within the organization
- KU4.** principles of programming applicable in the application development process
- KU5.** how to model game elements with the required parameters and procedures matching the design specification.
- KU6.** integration of Art asset creations into the game according to the design guidelines laid out in Design Document.
- KU7.** implementation of various application subsystems in accordance with (as per) Design requirements
- KU8.** optimization techniques pertaining to application performance and size
- KU9.** how to Implement the User Interface as per Design specification laid out for User and Application information.
- KU10.** publishing techniques to convert a application across multiple platforms.

Generic Skills (GS)

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

- GS1.** make accurate notes about features to be implemented in the modules assigned by the lead programme
- GS2.** convert the features into task list and schedule a work plan
- GS3.** log and Report the progress of tasks completed with descriptions about feature being implemented.
- GS4.** read and Classify feature listing into Application Module.
- GS5.** read and Integrate Application programming interface (API) Documentation about Plugins and Libraries.
- GS6.** read and interpret developer guides and manuals of game engine, development tools and other libraries
- GS7.** identify and deliberate possible idea for architecture and framework implementation with the lead Programmer.
- GS8.** communicate ideas, suggestions and issues relating to Tools and Technology used in development using appropriate terminologies within a collaborative environment
- GS9.** present/solicit feedback on work and identify modifications required
- GS10.** plan the implementation of application module that is assigned to meet agreed work deliverables
- GS11.** plan project file organisation, structure and integration with the base code efficiently.
- GS12.** segregate the application modules implementation tasks required for the project into a manageable work breakdown structure for the team.



Qualification Pack

- GS13.** guide the team with methodical approaches to identify and resolve any technical issues that arise during sampling and synthesis.
- GS14.** provide constructive feedback to the team for improvement when necessary.
- GS15.** make well informed and appropriate choices of sampling and synthesis techniques based on available resources.
- GS16.** ensure that art and assets adhere fully to the creative and technical direction provided by the designer.

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Construct VR tools</i>	22	33	-	-
PC1. Analyse Virtual Reality principles and basics	2	3	-	-
PC2. Analyse Virtual Reality principles and basics	2	3	-	-
PC3. Overlay (image, 2D, 3D) information on top of pre-existing data	2	3	-	-
PC4. Define VR catalogues	2	3	-	-
PC5. Facilitate data and visualize concepts	2	3	-	-
PC6. Researching and developing pipeline solutions and techniques	2	3	-	-
PC7. Consider real world and interpret utilities around features	2	3	-	-
PC8. Prepare theme of real and virtual data	2	3	-	-
PC9. Design and develop VR Application in line with existing features / story or specifications	2	3	-	-
PC10. Describe image recognition and object recognition	2	3	-	-
PC11. Production of VR/AR experiences viewable on mobile devices and VR headsets	2	3	-	-
<i>Develop VR Models</i>	18	27	-	-
PC12. Analyse different VR Platforms	2	3	-	-
PC13. Develop application for each VR platform with their specific SDKs	2	3	-	-
PC14. Working with pre-created images and 3D models to create photorealistic experiences	2	3	-	-
PC15. Spike testing and rapid proofing of concepts around emerging technologies	2	3	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. create rapid prototypes of systems in Unity, including asset integration into Unity	2	3	-	-
PC17. Building user interfaces in Unity utilizing diegetic, meta and spatial elements.	2	3	-	-
PC18. Spike testing and rapid proofing of concepts around emerging technologies.	2	3	-	-
PC19. Create a cross platform VR application	2	3	-	-
PC20. Integration of assets into the application to demonstrate basic features	2	3	-	-
NOS Total	40	60	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MES/N0524
NOS Name	Develop VR Application
Sector	Media & Entertainment
Sub-Sector	Gaming
Occupation	Art and Design
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	NA
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Assessment Guidelines and Assessment Weightage

Assessment Guidelines

Criteria for assessment for each Qualification Pack will be created by the Sector

Skill Council.

1. 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

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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/N2513.Artificial intelligence and machine learning	28	72	-	-	100	20
MES/N2515.Deploy Internet of things (IoT)	24	76	-	-	100	20
MES/N2516.Enterprise block chain	30	70	-	-	100	20
MES/N0104.Maintain Workplace Health & Safety	50	50	-	-	100	10
MES/N2816.Perform code optimisation routines and use version control on code	30	70	-	-	100	10
Total	162	338	-	-	500	80

Elective: 1 AR Developer

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
MES/N0521.Analyse concepts and characteristics of AR	40	60	0	0	100	10
MES/N0522.Create AR application based on design	31	69	0	0	100	10



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National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
Total	71	129	-	-	200	20

Elective: 2 VR Developer

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
MES/N0523.Analyse concepts of VR Technologies	40	60	0	0	100	10
MES/N0524.Develop VR Application	40	60	0	0	100	10
Total	80	120	-	-	200	20



Qualification Pack

Acronyms

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

Qualification Pack

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.

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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.