TRAINING REGULATIONS

3D ANIMATION NC III

INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Superhighway, Taguig City, Metro Manila

Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, "Establishment and Administration of the National Trade Skills Standards" of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skills standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serve as basis for the:

1 Competency assessment and certification;
2 Registration and delivery of training programs; and
3 Development of curriculum and assessment instruments.

Each TR has four sections:

Section 1 **Definition of Qualification** – describes the qualification and defines the competencies that comprise the qualification.

Section 2 The **Competency Standards** format was revised to include the Required Knowledge and Required Skills per element. These fields explicitly state the required knowledge and skills for competent performance of a unit of competency in an informed and effective manner. These also emphasize the application of knowledge and skills to situations where understanding is converted into a workplace outcome.

Section 3 **Training Arrangements** - contain information and requirements which serve as bases for training providers in designing and delivering competency-based curriculum for the qualification. The revisions to section 3 entail identifying the Learning Activities leading to achievement of the identified Learning Outcome per unit of competency.

Section 4 **Assessment and Certification Arrangements** - describe the policies governing assessment and certification procedures for the qualification.

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3D ANIMATION

NATIONAL CERTIFICATE LEVEL III

TRAINING REGULATIONS FOR
3D ANIMATION NC III

Section 1 3D ANIMATION NC III QUALIFICATIONS

The **3D ANIMATION NC III** Qualification consists of competencies that a person must achieve to produce 3D animation. This include competencies in creating 3D models for animation, applying shader and texture on 3D models, setting of character rigging, animating character and lighting and rendering animation scene.

This Qualification is packaged from the competency map of the Information and Communication Technology (ICT) Industry as shown in Annex A.

The units of competency comprising this qualification include the following:

UNIT CODE	BASIC COMPETENCIES
500311109	Lead workplace communication
500311110	Lead small teams
500311111	Develop and practice negotiation skills
500311112	Solve problems related to work activities
500311113	Use mathematical concepts and techniques
500311114	Use relevant technologies
500311142	Apply critical thinking and problem solving techniques in the workplace
500311144	Use information creatively and critically
500311145	Work in a diverse environment

UNIT CODE	COMMON COMPETENCIES
ICT315202	Apply quality standards
ICT311203	Perform Computer Operations

UNIT CODE	CORE COMPETENCIES
ICT216308	Create 3D Models for Animation
ICT216309	Apply Shader and Texture on 3D Models
ICT216310	Set Character Rigging
ICT216311	Animate Character
ICT216312	Light and Render Animation Scene

A person who has achieved this Qualification is competent to be:

- 3D Modeller
- 3D Texture Artists
- 3D Lighting Artists
- 3D Layout and Animatic Artist
- 3D Animator
- 3D Rigger
- 3D Render Artist
- 3D Asset Creator
- 3D Visualizer
- 3D Generalist

SECTION 2. COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in **3D ANIMATION NC III.**

BASIC COMPETENCIES

UNIT OF COMPETENCY : LEAD WORKPLACE COMMUNICATION

UNIT CODE : 500311109

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to lead in the dissemination and discussion of ideas, information and issues in the workplace.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Communicate information about workplace processes	1.1. Appropriate ***communication method*** is selected 1.2. Multiple operations involving several topics areas are communicated accordingly 1.3. Questions are used to gain extra information 1.4. Correct sources of information are identified 1.5. Information is selected and organized correctly 1.6. Verbal and written reporting is undertaken when required 1.7. Communication skills are maintained in all situations	1.1. Organization requirements for written and electronic communication methods 1.2. Effective verbal communication methods 1.3. Methods of Communication 1.4. Types of Question 1.5. Communication Tools 1.6. Questioning Techniques	1.1. Organizing information 1.2. Understanding and conveying intended meaning 1.3. Participating in variety of workplace discussions 1.4. Complying with organization requirements for the use of written and electronic communication methods 1.5. Reporting occupational hazards during safety meeting
2. Lead workplace discussions	2.1 Response to workplace issues are sought 2.2 Response to workplace issues are provided immediately 2.3 Constructive contributions are made to workplace discussions on such issues as production, quality and safety 2.4 Goals/objectives and Action plan undertaken in the workplace are communicated	2.1. Leading as a management function 2.2. Barriers of communication 2.3. Effective verbal communication methods 2.4. Method/techniques of discussion 2.5. How to lead discussion 2.6. How to solicit response 2.7. Goal setting and action planning	2.1. Communicating effectively 2.2. Consulting the crew on the prepared menu for the month

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate personnel 3.4 Communication problems and issues are raised as they arise	3.1. Types of issues and problems in the workplace 3.2. Written and electronic communication methods 3.3. Communication barriers affecting workplace discussions	3.1. Identifying cause of problems 3.2. Identifying problems and issues 3.3. Organizing information on problems and issues 3.4. Relating problems and issues in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Methods of communication	1.1. Non-verbal gestures 1.2. Verbal 1.3. Face to face 1.4. Two-way radio 1.5. Speaking to groups 1.6. Using telephone 1.7. Written 1.8. Internet

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Dealt with a range of communication/information at one time 1.2 Made constructive contributions in workplace issues 1.3 Sought workplace issues effectively 1.4 Responded to workplace issues promptly 1.5 Presented information clearly and effectively written form 1.6 Used appropriate sources of information 1.7 Asked appropriate questions 1.8 Provided accurate information
2. Resource Implications	The following resources should be provided: 2.1. Variety of Information 2.2. Communication tools 2.3. Simulated workplace
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Competency in this unit must be assessed through 3.2 Direct Observation 3.3 Interview
4. Context for Assessment	4.1. Competency may be assessed in the workplace or in simulated workplace environment

UNIT OF COMPETENCY : LEAD SMALL TEAMS (Guide and Lead Others/Be Responsible to Others)

UNIT CODE : 500311110

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes to lead small teams including setting and maintaining team and individual performance standards.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Provide team leadership	1.1 **Work requirements** are identified and presented to team members 1.2 Reasons for instructions and requirements are communicated to team members 1.3 **Team members' queries and concerns** are recognized, discussed and dealt with	1.1. Company policies and procedures 1.2. How performance expectations are set 1.3. Methods of Monitoring Performance 1.4. Client expectations 1.5. Team member's duties and responsibilities 1.6. Definition of Team 1.7. Skills and techniques in promoting team building 1.8. Up-to-date dissemination of instructions and requirements to members 1.9. Art of listening and treating individual team members concern	1.1. Communication skills required for leading teams 1.2. Team building skills 1.3. Negotiating skills 1.4. Evaluation skills
2. Assign responsibilities	2.1. Duties and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy 2.2. Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible	2.1. Concept of delegation 2.2. How to delegate 2.3. Understanding individual differences 2.4. Methods of monitoring performance 2.5. Duties and responsibilities of each team member 2.6. Knowledge in identifying each team member duties and responsibilities	2.1. Delegating skills 2.2. Identifying individual skills, knowledge and attitude as basis for allocating responsibilities 2.3. Identifying each team member duties and responsibilities
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs and according to assignment requirements 3.2 Performance expectations are based on individual team member's duties and area of responsibility 3.3 Performance expectations are	3.1 Definition of performance indicators/ criteria 3.2 Definition of team goals and expectations 3.3 Methods of monitoring performance 3.4 Client expectations 3.5 Team member's duties and responsibilities	3.1 Identifying performance indicators 3.2 Evaluating performance 3.3 Setting individual performance target/ expectation indicators

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	discussed and disseminated to individual team members	3.6 Defining performance expectations criteria	
4. Supervise team performance	4.1. **Monitoring of performance** takes place against defined performance criteria and/or assignment instructions and corrective action taken if required 4.2 Team members are provided with feedback, positive support and advice on strategies to overcome any deficiencies 4.3 Performance issues which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5 Team operations are monitored to ensure that employer/client needs and requirements are met 4.6 Follow-up communication is provided on all issues affecting the team 4.7 All relevant documentation is completed in accordance with company procedures	4.1 Understanding monitoring of work 4.2 How to undertake corrective action 4.3 Understanding feedback and procedure 4.4 Feedback reporting procedure 4.5 Methods of monitoring performance 4.6 Team member's duties and responsibilities 4.7 Monitoring team operation to ensure client needs and satisfaction	4.1 Monitoring skills 4.2 Setting priorities 4.3 Evaluating performance 4.4 Informal/ formal counseling skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work requirements	1.1. Client Profile 1.2. Assignment instructions
2. Team member's concerns	2.1 Roster/shift details
3. Monitor performance	3.1 Formal process 3.2 Informal process
4. Feedback	4.1. Formal process 4.2. Informal process
5. Performance issues	5.1 Work output 5.2 Work quality 5.3 Team participation 5.4 Compliance with workplace protocols 5.5 Safety 5.6 Customer service

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Maintained or improved individuals and/or team performance given a variety of possible scenario 1.2. Assessed and monitored team and individual performance against set criteria 1.3. Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4. Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5. Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
2. Resource Implications	The following resources should be provided: 2.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2. Materials relevant to the proposed activity or task
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Direct observations of work activities of the individual member in relation to the work activities of the group 3.2. Observation of simulation and/or role play involving the participation of individual member to the attainment of organizational goal 3.3. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
4. Context for Assessment	4.1. Competency assessment may occur in workplace or any appropriately simulated environment 4.2. Assessment shall be observed while task are being undertaken whether individually or in-group

UNIT OF COMPETENCY : DEVELOP AND PRACTICE NEGOTIATION SKILLS

UNIT CODE : 500311111

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes required to collect information in order to negotiate to a desired outcome and participate in the negotiation.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan negotiations	1.1 Information on ***preparing for negotiation*** is identified and included in the plan 1.2 Information on creating ***non-verbal environments*** for positive negotiating is identified and included in the plan 1.3 Information on ***active listening*** is identified and included in the plan 1.4 Information on different ***questioning techniques*** is identified and included in the plan 1.5 Information is checked to ensure it is correct and up-to-date	1.1. Knowledge on Codes of practice and guidelines for the organization 1.2. Knowledge of organizations policy and procedures for negotiations 1.3. Decision making and conflict resolution strategies procedures 1.4. Concept of negotiation	1.1. Communication skills (verbal and listening) 1.2. Active listening 1.3. Setting conflict 1.4. Preparing conflict resolution 1.5. Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation 1.6. Interpersonal skills to develop rapport with other parties
2. Participate in negotiations	2.1 Criteria for successful outcome are agreed upon by all parties 2.2 Desired outcome of all parties are considered 2.3 Appropriate language is used throughout the negotiation 2.4 A variety of questioning techniques are used 2.5 The issues and processes are documented and agreed upon by all parties 2.6 Possible solutions are discussed and their viability assessed 2.7 Areas for agreement are confirmed and recorded 2.8 Follow-up action is agreed upon by all parties	2.1 Outcome of negotiation 2.2 Knowledge on Language 2.3 Different Questioning techniques 2.4 Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation 2.5 Flexibility 2.6 Empathy 2.7 Decision making and conflict resolution strategies procedures 2.8 Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation	2.1 Negotiating skill 2.2 Communication skills (verbal and listening) 2.3 Observation skills 2.4 Interpersonal skills to develop rapport with other parties 2.5 Applying effective questioning techniques 2.6 Setting conflict

RANGE OF VARIABLES

VARIABLE	RANGE
1. Preparing for negotiation	1.1. Background information on other parties to the negotiation 1.2. Good understanding of topic to be negotiated 1.3. Clear understanding of desired outcome/s 1.4. Personal attributes 1.4.1. self awareness 1.4.2. self esteem 1.4.3. objectivity 1.4.4. empathy 1.4.5. respect for others 1.5. Interpersonal skills 1.5.1 listening/reflecting 1.5.2 non- verbal communication 1.5.3 assertiveness 1.5.4 behavior labeling 1.5.5 testing understanding 1.5.6 seeking information 1.5.7 self-disclosing 1.6. Analytic skills 1.6.1 observing differences between content and process 1.6.2 identifying bargaining information 1.6.3 applying strategies to manage process 1.6.4 applying steps in negotiating process 1.6.5 strategies to manage conflict 1.6.6 steps in negotiating process 1.6.7 options within organization and externally for resolving conflict
2. Non- verbal environments	2.1. Friendly reception 2.2. Warm and welcoming room 2.3. Refreshments offered 2.4. Lead in conversation before negotiation begins
3. Active listening	3.1. Attentive 3.2. Don't interrupt 3.3. Good posture 3.4. Maintain eye contact 3.5. Reflective listening
4. Questioning techniques	4.1. Direct 4.2. Indirect 4.3. Open-ended

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome 1.2 Participated in negotiation with at least one person to achieve an agreed outcome
2. Resource Implications	The following resources should be provided: 2.1 Room with facilities necessary for the negotiation process 2.2 Human resources (negotiators)
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation/demonstration and questioning 3.2 Portfolio assessment 3.3 Oral and written questioning 3.4 Third party report
4. Context for Assessment	4.1 Competency to be assessed in real work environment or in a simulated workplace setting.

UNIT OF COMPETENCY : SOLVE PROBLEMS RELATED TO WORK ACTIVITIES

UNIT CODE : 500311112

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause of problems.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the problem	1.1. Variances are identified from normal operating parameters; and product quality 1.2. Extent, cause and nature are of the problem are defined through observation, investigation and ***analytical techniques*** 1.3. ***Problems*** are clearly stated and specified	1.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations 1.2. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 1.3. Relevant equipment and operational processes 1.4. Enterprise goals, targets and measures 1.5. Enterprise quality, OSH and environmental requirement 1.6. Enterprise information systems and data collation 1.7. Industry codes and standards 1.8. Normal operating parameters and product quality	1.1. Use range of formal problem solving techniques 1.2. Identify and clarify the nature of the problem 1.3. Evaluate the effectiveness of a present process in the galley 1.4. Apply analytical techniques
2. Determine fundamental causes of the problem	2.1. Possible causes are identified based on experience and the use of problem solving tools / analytical techniques. 2.2. Possible cause statements are developed based on findings	2.1 Relevant equipment and operational processes 2.2 Enterprise goals, targets and measures 2.3 Enterprise quality, OHS and environmental requirements	2.1 Analysis of root causes

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.3. Fundamental causes are identified per results of investigation conducted	2.4 Enterprise information systems and data collation 2.5 Industry codes and standards	
3. Determine corrective action	3.1. All possible options are considered for resolution of the problem 3.2. Strengths and weaknesses of possible options are considered 3.3. Corrective actions are determined to resolve the problem and possible future causes 3.4. ***Action plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures	3.1. Understanding the procedure in undertaking corrective action 3.2. Principles of decision making strategies and techniques 3.3. Enterprise information systems and data collation 3.4. Action planning	3.1. Identifying and clarifying the nature of the problem 3.2. Devising the best solution 3.3. Evaluating the solution 3.4. Implementing developed plan to rectify the problem 3.5. Implementing corrective and preventive actions based on root cause analysis
4. Provide recommendations to manager	4.1. Report on recommendations are prepared 4.2. Recommendations are presented to appropriate personnel. 4.3. Recommendations are followed-up, if required	4.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations 4.2. How to make a report and recommendation	4.1 Using range of formal problem solving techniques 4.2 Identifying and clarifying the nature of the problem 4.3 Devising the best solution 4.4 Evaluating the solution 4.5 Implementation of a developed plan to rectify the problem 4.6 Writing report and recommenda-tions

RANGE OF VARIABLES

VARIABLE	RANGE
1. Analytical techniques	1.1. Brainstorming 1.2. Intuitions/Logic 1.3. Cause and effect diagrams 1.4. Pareto analysis 1.5. SWOT analysis 1.6. Gant chart, Pert CPM and graphs 1.7. Scattergrams
2. Problem	2.1. Non – routine process and quality problems 2.2. Equipment selection, availability and failure 2.3. Teamwork and work allocation problem 2.4. Safety and emergency situations and incidents
3. Action plans	3.1. Priority requirements 3.2. Measurable objectives 3.3. Resource requirements 3.4. Timelines 3.5. Co-ordination and feedback requirements 3.6. Safety requirements 3.7. Risk assessment 3.8. Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Identified the problem 1.2. Determined the fundamental causes of the problem 1.3. Determined the correct / preventive action 1.4. Provided recommendation to manager These aspects may be best assessed using a range of scenarios / case studies / what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
2. Resource Implications	2.1. Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as bank of questions which will be used to probe the reason behind the observable action.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Case studies on solving problems in the workplace 3.2. Observation The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1. In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY : USE MATHEMATICAL CONCEPTS AND TECHNIQUES
UNIT CODE : 500311113
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required in application of mathematical concepts and techniques.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify mathematical tools and techniques to solve problem	1.1 Problem areas are identified based on given condition 1.2 ***Mathematical techniques*** are selected based on the given problem	1.1. Fundamental operation (addition, subtraction, division, multiplication) 1.2. Units of measurement and its conversion 1.3. Fundamental of units 1.4. Standard formulas 1.5. Basic measuring tools/devices 1.6. Measurement system 1.7. Basic measuring tools/devices 1.8. Steps in solving problem	1.1. Identifying and selecting different measuring tools 1.2. Applying different formulas in solving problems 1.3. Describing the units of measurement and fundamental units 1.4. Stating arithmetic calculations involving the following; addition, subtraction, division, multiplication 1.5. Applying theory into actual application on shipboard catering processes
2. Apply mathematical procedure/ solution	2.1 Mathematical techniques are applied based on the problem identified 2.2 Mathematical computations are performed to the level of accuracy required for the problem 2.3 Results of mathematical computation are determined and verified based on job requirements	2.1. Problem-based questions 2.2. Estimation 2.3. Use of mathematical tools and standard formulas 2.4. Mathematical techniques	2.1. Solving mathematical computations 2.2. Converting Metric to English 2.3. Selecting and using appropriate and efficient techniques and strategies to solve problems
3. Analyze results	3.1 Results of application are reviewed based on expected and required specifications and outcome 3.2 ***Appropriate action*** is applied in case of error	3.1. Techniques in analyzing the results 3.2. Process in reviewing the results 3.3. Precision and accuracy 3.4. Four fundamental operations 3.5. Steps in solving problem 3.6. Standard formulas 3.7. Conversion measurement	3.1. Analyzing the result based on the specified requirements 3.2. Interpreting and communicating the results of the analysis

RANGE OF VARIABLES

VARIABLES	RANGE
1. Mathematical techniques	May include: 1.1 Four fundamental operations 1.2 Measurements 1.3 Use/Conversion of units of measurements 1.4 Use of standard formulas
2. Appropriate action	May include: 2.1. Review in the use of mathematical techniques (e.g. recalculation, re-modeling) 2.2. Report error to immediate superior for proper action

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified, applied and reviewed the use of mathematical concepts and techniques to workplace problems
2. Resource Implications	The following resources should be provided: 2.1 Calculator 2.2 Basic measuring tools 2.3 Case Problems
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Authenticated portfolio 3.2 Written Test 3.3 Interview/Oral Questioning 3.4 Demonstration
4. Context for Assessment	4.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : USE RELEVANT TECHNOLOGIES
(Apply technology effectively)

UNIT CODE : 500311114

UNIT DESCRIPTOR : This unit of competency covers the knowledge, skills, and attitude required in selecting, sourcing and applying appropriate and affordable technologies in the workplace.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Study/select appropriate technology	1.1 Usage of different ***technologies*** is determined based on job requirements 1.2 Appropriate technology is selected as per work specification	1.1. Awareness on technology and its function 1.2. Communication techniques 1.3. Health and safety procedure 1.4. Company policy in relation to relevant technology 1.5. Machineries/ equipment and their application 1.6. Software programs	1.1. Identifying relevant technology on job
1. Apply relevant technology	2.1 Relevant technology is effectively used in carrying out function 2.2 Applicable software and hardware are used as per task requirement 2.3 ***Management concepts*** are observed and practiced as per established industry practices	1.1. Knowledge on operating instructions 1.2. Understanding software and hardware system 1.3. Communication techniques 1.4. Health and safety procedure 1.5. Company policy in relation to relevant technology 1.6. Different management concepts 1.7. Technology adaptability 1.8. Office technology 1.9. Industrial technology 1.10. System technology 1.11. Training technology 1.12. Different software/ hardware 1.13. 5S (Proper housekeeping)	2.1 Applying relevant technology 2.2 Communicating skills 2.3 Using software applications skills 2.4 Conducting risk assessment
2. Maintain/ enhance relevant technology	3.1 Maintenance of technology is applied in accordance with the ***industry standard operating procedure***, ***manufacturer's operating guidelines*** and ***occupational health and safety***	3.1 Awareness on technology and its function 3.2 Repair and maintenance procedure 3.3 Health and safety procedure 3.4 Company policy in relation to relevant technology 3.5 Upgrading of technology	3.1 Performing basic troubleshooting skills 3.2 Identifying failures or defects 3.3 Communication skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	procedure to ensure its operative ability 3.2 Updating of technology is maintained through continuing education or training in accordance with job requirement 3.3 Technology failure/ defect is immediately reported to the concern/responsible person or section for ***appropriate action***	3.6 Organizational set-up/work flow	3.4 Applying corrective and preventive maintenance

RANGE OF VARIABLES

VARIABLE	RANGE
1. Technology	May include: 1.1 Office technology 1.2 Industrial technology 1.3 System technology 1.4 Information technology 1.5 Training technology
2. Management concepts	May include: 2.1. Real Time Management 2.2. KAIZEN or continuous improvement 2.3. 5 S 2.4. Total Quality Management 2.5. Other management/productivity tools
3. Industry standard operating procedure	3.1 Written guidelines relative to the usage of office technology/equipment 3.2 Verbal advise/instruction from the co-worker
4. Manufacturer's operating guidelines/ instructions	4.1 Written instruction/manuals of specific technology/ equipment 4.2 General instruction manual 4.3 Verbal advise from manufacturer relative to the operation of equipment
5. Occupational health and safety procedure	5.1 Relevant statutes on OSH 5.2 Company guidelines in using technology/equipment
6. Appropriate action	6.1 Implementing preventive maintenance schedule 6.2 Coordinating with manufacturer's technician

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Studied and selected appropriate technology consistent with work requirements 1.2 Applied relevant technology 1.3 Maintained and enhanced operative ability of relevant technology
2. Resource Implications	The following resources should be provided: 2.1 Relevant technology 2.2 Interview and demonstration questionnaires 2.3 Assessment packages
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Interview 3.2. Actual demonstration 3.3. Authenticated portfolio (related certificates of training/seminar)
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or simulated environment

UNIT OF COMPETENCY: APPLY CRITICAL THINKING AND PROBLEM SOLVING TECHNIQUES IN THE WORKPLACE

UNIT CODE : 500311142

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause of problems.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the problem	1.1. Variances are identified from normal operating parameters; and product quality 1.2. Extent, cause and nature are of the problem are defined through observation, investigation and ***analytical techniques*** 1.3. ***Problems*** are clearly stated and specified	1.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize nonstandard situations 1.2. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 1.2.1. Relevant equipment and operational processes 1.2.2. Enterprise goals, targets and measures 1.2.3. Enterprise quality, OHS and environmental requirement 1.2.4. Enterprise information systems and data collation 1.2.5. Industry codes and standards	1.1. Using range of formal problem solving techniques 1.2. Identifying and clarifying the nature of the problem
2. Determine fundamental causes of the problem	2.1. Possible causes are identified based on experience and the use of problem solving tools / analytical techniques. 2.2. Possible cause statements are developed based on findings 2.3. Fundamental causes are identified per results of investigation conducted	2.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize nonstandard situations 2.2. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 2.2.1. Relevant equipment and operational processes 2.2.2. Enterprise goals, targets and measures	2.1. Using range of formal problem solving techniques 2.2. Identifying and clarifying the nature of the problem

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		2.2.3. Enterprise quality, OHS and environmental requirement 2.2.4. Enterprise information systems and data collation 2.2.5. Industry codes and standards	
3. Determine corrective action	3.1. All possible options are considered for resolution of the problem 3.2. Strengths and weaknesses of possible options are considered 3.3. Corrective actions are determined to resolve the problem and possible future causes 3.4. ***Action plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures	3.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize nonstandard situations 3.2. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 3.2.1. Relevant equipment and operational processes 3.2.2. Enterprise goals, targets and measures 3.2.3. Enterprise quality, OHS and environmental requirement 3.2.4. Principles of decision making strategies and techniques 3.2.5. Enterprise information systems and data collation 3.2.6. Industry codes and standards	3.1. Using range of formal problem solving techniques 3.2. Identifying and clarifying the nature of the problem 3.3. Devising the best solution 3.4. Evaluating the solution 3.5. Implementation of a developed plan to rectify the problem
4. Provide recommendation/s to manager	4.1. Report on recommendations are prepared 4.2. Recommendations are presented to appropriate personnel. 4.3. Recommendations are followed-up, if required	4.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize nonstandard situations 4.2. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations	4.1. Using range of formal problem solving techniques 4.2. Identifying and clarifying the nature of the problem 4.3. Devising the best solution 4.4. Evaluating the solution 4.5. Implementation of a developed plan to rectify the problem

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		4.2.1. Relevant equipment and operational processes 4.2.2. Enterprise goals, targets and measures 4.2.3. Enterprise quality, OHS and environmental requirement 4.2.4. Principles of decision making strategies and techniques 4.2.5. Enterprise information systems and data collation 4.2.6. Industry codes and standards	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Analytical techniques	May include: 1.1. Brainstorming 1.2. Intuitions/Logic 1.3. Cause and effect diagrams 1.4. Pareto analysis 1.5. SWOT analysis 1.6. Gant chart, Pert CPM and graphs 1.7. Scattergrams
2. Problem	May include: 2.1. Non – routine process and quality problems 2.2. Equipment selection, availability and failure 2.3. Teamwork and work allocation problem 2.4. Safety and emergency situations and incidents
3. Action plans	May include: 3.1. Priority requirements 3.2. Measurable objectives 3.3. Resource requirements 3.4. Timelines 3.5. Co-ordination and feedback requirements 3.6. Safety requirements 3.7. Risk assessment 3.8. Environmental requirements

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Identified the problem 1.2. Determined the fundamental causes of the problem 1.3. Determined the correct / preventive action 1.4. Provided recommendation to manager These aspects may be best assessed using a range of scenarios / case studies / what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
2. Resource implication	2.1. Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as bank of questions which will be used to probe the reason behind the observable action
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Case studies on solving problems in the workplace 3.2. Observation The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components
4. Context of Assessment	4.1. In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units

UNIT OF COMPETENCY: USE INFORMATION CREATIVELY AND CRITICALLY

UNIT CODE : 500311144

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use technical information system and information technology, and apply information technology (IT).

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Use technical information systems and information technology	1.1. Collate and organize ***information*** into a suitable form for reference and use 1.2. Classify stored information so that it can be quickly identified and retrieved when needed 1.3. Advise and offer guidance to people who need to find and use information 1.4. Operate the ***technical information*** system using agreed procedures 1.5. Operate appropriate and valid procedures for inputting, maintaining and archiving information	1.1. Application in collating information 1.2. Procedures for inputting, maintaining and archiving information 1.3. Guidance to people who need to find and use information 1.4. Organize information 1.5. Classify stored information for identification and retrieval 1.6. Operate the technical information system by using agreed procedures	1.1. Collating information 1.2. Operating appropriate and valid procedures for inputting, maintaining and archiving information 1.3. Advising and offering guidance to people who need to find and use information 1.4. Organizing information into a suitable form for reference and use 1.5. Classifying stored information for identification and retrieval 1.6. Operating the technical information system by using agreed procedures
2. Apply information technology (IT)	2.1. Utilize the ***software and IT systems*** that are required to execute the project activities 2.2. Handle, edit, format and check information and data obtained from a range of internal and external ***sources*** 2.3. Extract, enter, and process information to produce the outputs required by ***customers*** 2.4. Share your own skills and understanding to help others 2.5. Implement the specified ***security measures*** to protect the confidentiality and integrity of project data held in IT systems	2.1. Attributes and limitations of available software tools 2.2. Procedures and work instructions for the use of IT 2.3. Operational requirements for IT systems 2.4. Sources and flow paths of data 2.5. Security systems and measures that can be used 2.6. Extract data and format reports 2.7. Methods of entering and processing information 2.8. WWW enabled applications	2.1. Identifying attributes and limitations of available software tools 2.2. Using procedures and work instructions for the use of IT 2.3. Describing operational requirements for IT systems 2.4. Identifying sources and flow paths of data 2.5. Determining security systems and measures that can be used 2.6. Extracting data and format reports 2.7. Describing methods of entering and processing information 2.8. Using WWW applications

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Edit, format and check information	3.1. Basic editing techniques is used 3.2. Accuracy of documents are check 3.3. Editing and formatting tools and techniques are used for more complex documents 3.4. Proof reading techniques is used to check that documents look professional	3.1. Basic file-handling techniques 3.2. Techniques in checking documents 3.3. Techniques in editing and formatting 3.4. Proof reading techniques	3.1. Using basic file-handling techniques is used for the software 3.2. Using different techniques in checking documents 3.3. Applying editing and formatting techniques 3.4. Applying proof reading techniques

RANGE OF VARIABLES

VARIABLE	RANGE
1. Information	May include: 1.1 Property 1.2 Organizational 1.3 Technical reference
2. Technical information	May include: 2.1 Paper based 2.2 Electronic
3. Software and IT systems	May include: 3.1 Spreadsheets 3.2 Databases 3.3 Word processing 3.4 Presentation
4. Sources	May include: 4.1 Other IT system 4.2 Manually created 4.3 Within own organization 4.4 Outside own organization 4.5 Geographically remote
5. Customers	May include: 5.1 Colleagues 5.2 Company and project management 5.3 Clients
6. Security measures	May include: 6.1 Access rights to input; 6.2 Passwords; 6.3 Access rights to outputs; 6.4 Data consistency and back-up; 6.5 Recovery plans

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Used technical information systems and information technology 1.2. Applied information technology (IT) 1.3. Edited, formatted and checked information
2. Resource implication	The following resources should be provided: 2.1. Computers 2.2. Software and IT system
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Direct observation 3.2. Oral interview and written test
4. Context of Assessment	4.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY: WORK IN A DIVERSE ENVIRONMENT

UNIT CODE : 500311145

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to work effectively in a workplace characterized by diversity in terms of religions, beliefs, races, ethnicities and other differences.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop an individual's cultural awareness and sensitivity	1.1. Individual differences with clients, customers and fellow workers are recognized and respected in accordance with enterprise policies and core values. 1.2. Differences are responded to in a sensitive and considerate manner 1.3. ***Diversity*** is accommodated using appropriate verbal and nonverbal communication. 1.4. Actions/decisions are maintained consistent with legislative requirements and enterprise guidelines.	1.1. Understanding cultural diversity in the workplace 1.2. Awareness of individual cultures and world geography 1.3. Norms of behavior for interacting and dialogue with specific groups (e.g., Muslims and other non-Christians, non-Catholics, tribes/ethnic groups, foreigners) 1.4. Different methods of verbal and non-verbal communication in a multicultural setting 1.5. Enterprise policies on workplace diversity (Workplace Diversity Policy)	1.1. Cross-cultural communication skills (i.e. different business customs, beliefs, communication strategies) 1.2. Communication skills – reading, writing, conversational skills 1.3. Affective skills – establishing rapport and empathy, understanding, etc. 1.4. Active Listening 1.5. Openness and flexibility in communication 1.6. Giving/receiving feedback 1.7. Identifying/ Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices
2. Work effectively in an environment that acknowledges and values cultural diversity	2.1. Knowledge, skills and experiences of others are recognized and documented in relation to team objectives. 2.2. Fellow workers are encouraged to utilize and share their specific qualities, skills or backgrounds with other team members and clients to enhance work outcomes. 2.3. Relations with customers and clients are maintained to show that	2.1. Recognizing and explaining the value of diversity in the economy and society in terms of Workforce development 2.2. The country's place in the global economy 2.3. Innovation 2.4. Social justice 2.5. Recognizing the importance of inclusiveness in a diverse environment	2.1. Cross-cultural communication skills 2.2. Communication skills – reading, writing, conversational skills 2.3. Affective skills – establishing rapport and empathy, understanding, etc. 2.4. Active Listening 2.5. Openness and flexibility in communication 2.6. Giving/receiving feedback

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	diversity is valued by the business.	2.6. Developing a shared vision and understanding of and commitment to team, departmental, and organizational goals and objectives 2.7. Strategies for customer service excellence	2.7. Identifying/ Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices 2.8. Teamwork and collaboration skills 2.9. Intercultural relations and mutual acceptance 2.10. Customer service excellence
3. Identify common issues in a multicultural and diverse environment	3.1. Diversity-related conflicts within the workplace are effectively addressed and resolved. 3.2. Discriminatory behavior towards customers/ stakeholders are minimized and addressed accordingly. 3.3. Change management policies are in place within the organization.	3.1. Understanding, valuing, and leveraging cultural diversity 3.2. Promoting inclusivity and conflict resolution 3.3. Addressing workplace harassment 3.4. Managing change and overcoming resistance to change 3.5. Advanced strategies for customer service excellence 3.6. Enterprise policies on workplace diversity (Workplace Diversity Policy)	3.1. Cross-cultural communication skills 3.2. Communication skills – reading, writing, conversational skills 3.3. Affective skills – establishing rapport and empathy, understanding, etc. 3.4. Active Listening 3.5. Openness and flexibility in communication 3.6. Giving/receiving feedback 3.7. Teamwork and collaboration skills 3.8. Intercultural relations and mutual acceptance 3.9. Advanced customer service excellence skills 3.10. Conflict management and resolution skills 3.11. Assertiveness and Negotiation

RANGE OF VARIABLES

VARIABLE	RANGE
1. Diversity	This refers to diversity in both the workplace and the community and may include divergence in – 1.1 Religion 1.2 Ethnicity, race or nationality 1.3 Culture 1.4 Gender, age or personality 1.5 Educational background

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Adjusted language and behavior as required by interactions with diversity 1.2. Identified and respected individual differences in colleagues, clients and customers 1.3. Applied relevant regulations, standards and codes of practice
2. Resource implication	The following resources should be provided: 2.1. Access to workplace and resources 2.2. Manuals and policies on Workplace Diversity
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Demonstration or simulation with oral questioning 3.2. Group discussions and interactive activities 3.3. Case studies/problems involving workplace diversity issues 3.4. Third-party report 3.5. Written examination 3.6. Role Plays
4. Context of Assessment	4.1. Competency assessment may occur in workplace or any appropriately simulated environment

COMMON COMPETENCIES

UNIT TITLE : APPLY QUALITY STANDARDS
UNIT CODE : ICT315202
UNIT DESCRIPTOR : This unit covers the knowledge, skills, attitudes and values needed to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organization procedures and customer requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess quality of received materials	1.1. Work instruction is obtained and work is carried out in accordance with standard operating procedures. 1.2. Received ***materials*** are checked against workplace standards and specifications. 1.3. Faulty materials related to work are identified and isolated. 1.4. ***Faults*** and any identified causes are recorded and/or reported to the supervisor concerned in accordance with workplace procedures. 1.5. Faulty materials are replaced in accordance with workplace procedures.	1.1. Relevant production processes, materials and products 1.2. Characteristics of materials, software and hardware used in production processes 1.3. Quality checking procedures 1.4. Quality Workplace procedures 1.5. Identification of faulty materials related to work	1.1. Reading skills required to interpret work instruction 1.2. Critical thinking 1.3. Interpreting work instructions
2. Assess own work	2.1. ***Documentation*** relative to quality within the company is identified and used. 2.2. Completed work is checked against workplace standards relevant to the task undertaken. 2.3. ***Errors*** are identified and isolated. 2.4. Information on the quality and other indicators of production performance are recorded in accordance with workplace procedures. 2.5. In cases of deviations from specific ***quality standards***, causes are documented and reported in accordance with the workplace' s standards operating procedures.	2.1. Safety and environmental aspects of production processes 2.2. Fault identification and reporting 2.3. Workplace procedure in documenting completed work 2.4. Workplace Quality Indicators	2.1. Carry out work in accordance with OHS policies and procedures

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Engage in quality improvement (Produce)	3.1. Process improvement procedures are participated in relative to workplace assignment. 3.2. Work is carried out in accordance with process improvement procedures. 3.3. Performance of operation or quality of product of service to ensure customer satisfaction is monitored.	3.1. Quality improvement processes 3.2. Company customers defined	3.1. Solution providing and decision-making 3.2. Practice company process improvement procedure

RANGE OF VARIABLES

VARIABLE	RANGE
1 Materials	1.1 Materials may include but not limited to: 1.1.1. Manuals 1.1.2. Job order 1.1.3. Instructional videos
2 Faults	2.1 Faults may include but not limited to: 2.1.1. Materials not to specification 2.1.2. Materials contain incorrect/outdated information 2.1.3. Hardware defects 2.1.4. Materials that do not conform with any regulatory agencies
3 Documentation	3.1 Organization work procedures 3.2 Manufacturer's instruction manual 3.3 Customer requirements 3.4 Forms
4 Errors	4.1 Errors may be related but not limited to the following: 4.1.1. Deviation from the requirements of the Client 4.1.2. Deviation from the requirement of the organization
5 Quality standards	5.1 Quality standards may be related but not limited to the following: 5.1.1. Materials 5.1.2. Hardware 5.1.3. Final product 5.1.4. Production processes 5.1.5. Customer service
6 Customer	6.1 Co-worker 6.2 Supplier/Vendor 6.3 Client 6.4 Organization receiving the product or service

EVIDENCE GUIDE

1 Critical aspect of competency	Assessment must show that the candidate: 1.1 Carried out work in accordance with the company's standard operating procedures 1.2 Performed task according to specifications 1.3 Reported defects detected in accordance with standard operating procedures 1.4 Carried out work in accordance with the process improvement procedures
2 Method of assessment	The assessor must select two of the following to objectively evaluate the candidate: 2.1 Demonstration observation with oral questioning 2.2 Practical demonstration 2.3 Interview
3 Resource implication	Materials, software and hardware to be used in a real or simulated situation
4 Context of Assessment	Assessment may be conducted in the workplace or in a simulated environment

UNIT TITLE : **PERFORM COMPUTER OPERATIONS**
UNIT CODE : **ELC311203**
UNIT DESCRIPTOR : This unit covers the knowledge, skills, (and) attitudes and values needed to perform computer operations which include inputting, accessing, producing and transferring data using the appropriate hardware and software

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for task to be undertaken	1.1. Requirements of task are determined according to job specifications 1.2. Appropriate ***hardware*** and ***software*** are selected according to task assigned and required outcome 1.3. Task is planned to ensure ***OH&S guidelines*** and procedures are followed 1.4. Client -specific guidelines and procedures are followed. 1.5. Required data security guidelines are applied in accordance with existing procedures.	1.1. Main types of computers and basic features of different operating systems 1.2. Main parts of a computer 1.3. Information on hardware and software 1.4. Data security guidelines	1.1. Reading and comprehension skills required to interpret work instruction and to interpret basic user manuals. 1.2. Communication skills to identify lines of communication, request advice, follow instructions and receive feedback. 1.3. Interpreting user manuals and security guidelines
2. Input data into computer	2.1. Data are entered into the computer using appropriate program/application in accordance with company procedures 2.2. Accuracy of information is checked and information is saved in accordance with standard operating procedures 2.3. Inputted data are stored in ***storage media*** according to requirements 2.4. Work is performed within ***ergonomic guidelines***	2.1. Basic ergonomics of keyboard and computer user 2.2. Storage devices and basic categories of memory 2.3. Relevant types of software	2.1. Technology skills to use equipment safely including keyboard skills. 2.2. Entering data
3. Access information using computer	3.1. Correct program/application is selected based on job requirements 3.2. Program/application containing the information required is accessed according to company procedures	3.1. General security, privacy legislation and copyright 3.2. Productivity Application 3.3. Business Application	3.1. Accessing information 3.2. Searching and browsing files and data

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.3. ***Desktop icons*** are correctly selected, opened and closed for navigation purposes 3.4. Keyboard techniques are carried out in line with OH&S requirements for safe use of keyboards		
4. Produce/ output data using computer system	4.1. Entered data are processed using appropriate software commands 4.2. Data printed out as required using computer hardware/peripheral devices in accordance with standard operating procedures 4.3. Files, data are transferred between compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures	4.1. Computer application in printing, scanning and sending facsimile 4.2. Types and function of computer peripheral devices	4.1. Computer data processing 4.2. Printing of data 4.3. Transferring files and data
5. Maintain computer equipment and systems	5.1. Systems for cleaning, minor ***maintenance*** and replacement of consumables are implemented 5.2. Procedures for ensuring security of data, including regular back-ups and virus checks are implemented in accordance with standard operating procedures 5.3. Basic file maintenance procedures are implemented in line with the standard operating procedures	5.1 Computer equipment/system basic maintenance procedures 5.2 Viruses 5.3 OH&S principles and responsibilities 5.4 Calculating computer capacity 5.5 System Software 5.6 Basic file maintenance procedures	5.1 Removing computer viruses from infected machines 5.2 Making backup files

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hardware and peripheral devices	1.1. Personal computers 1.2. Networked systems 1.3. Communication equipment 1.4. Printers 1.5. Scanners 1.6. Keyboard 1.7. Mouse
2. Software	Software includes the following but not limited to: 2.1. Word processing packages 2.2. Data base packages 2.3. Internet 2.4. Spreadsheets
3. OH & S guidelines	3.1. OHS guidelines 3.2. Enterprise procedures
4. Storage media	Storage media include the following but not limited to: 4.1. diskettes 4.2. CDs 4.3. zip disks 4.4. hard disk drives, local and remote
5. Ergonomic guidelines	5.1 Types of equipment used 5.2 Appropriate furniture 5.3 Seating posture 5.4 Lifting posture 5.5 Visual display unit screen brightness
6. Desktop icons	Icons include the following but not limited to: 6.1 directories/folders 6.2 files 6.3 network devices 6.4 recycle bin
7. Maintenance	7.1 Creating more space in the hard disk 7.2 Reviewing programs 7.3 Deleting unwanted files 7.4 Backing up files 7.5 Checking hard drive for errors 7.6 Using up to date anti-virus programs 7.7 Cleaning dust from internal and external surfaces

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Selected and used hardware components correctly and according to the task requirement 1.2. Identified and explain the functions of both hardware and software used, their general features and capabilities 1.3. Produced accurate and complete data in accordance with the requirements 1.4. Used appropriate devices and procedures to transfer files/data accurately 1.5. Maintained computer system
2. Method of assessment	2.1. The assessor may select two of the following assessment methods to objectively assess the candidate: 2.1.1. Observation 2.1.2. Questioning 2.1.3. Practical demonstration
3. Resource implication	3.1. Computer hardware with peripherals 3.2. Appropriate software
4. Context of Assessment	Assessment may be conducted in the workplace or in a simulated work environment

CORE COMPETENCIES

UNIT TITLE : CREATE 3D MODELS FOR ANIMATION
UNIT CODE : ICT 216308
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to interpret the technical specifications and techniques to produce 3D Models with UV mapping for animation productions.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify 3D Modeling requirements	1.1. ***Design brief*** on ***creative and technical requirements*** including ***production specifications*** and ***references*** are identified and discussed with ***relevant personnel.*** 1.2. All necessary ***equipment*** and ***required peripherals*** to be used are identified and prepared according to task to be undertaken.	1.1. Verbal communication 1.2. Written communication 1.3. Intellectual Property Rights concerns 1.4. Physical Science 1.5. Life Science 1.6. Human and Animal Anatomy and Physiology 1.7. Architectural and Structural concept 1.8. Industrial and Mechanical concept 1.9. Computer hardware requirements and specifications for 3D software 1.10. Installation of 3D software, photo editing software 1.11. Internet Browsing 1.12. Practicing 3Rs – 1.13. Reduce, Reuse, Recycle/recover and environmental policies.	1.1. Design and Drawing skills for both living and non-living. 1.2. Skills in reading and analyzing storyboard 1.3. Effective Communication skills 1.4. Presentation skills 1.5. Computer operation skills 1.6. Practicing OSHS, EHSM, 3Rs and 5S
2. Identify and select 3D animation software	2.1. Range of industry's standard ***3D animation software*** including computer-assisted techniques are identified for suitability. 2.2. Computer hardware and software is assessed vis-à-vis creative and technical requirements and ***production specifications***. 2.3. 3D animation software is selected in consultation with the appropriate personnel to ensure that output met requirements.	2.1. Verbal and Written communication 2.2. OHS Standards 2.3. End User License Agreement 2.4. OHS processes and procedure for Computer Hardware 2.5. Familiarization of 2D, 3D and photo editing software's' user interface and its major tools. 2.6. Cross platform data transfer 2.7. Internet browsing 2.8. Practicing 3Rs –	2.1. Effective Communication skills 2.2. Practicing 3D Modeling tools 2.3. Computer operation skills 2.4. Practicing OSHS, EHSM, 3Rs and 5S

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.4. Selected 3D animation software is secured in accordance with the specified ***delivery platform***.	2.9. Reduce, Reuse, Recycle/recover and environmental policies.	
3. Create 3D models and images	3.1 Familiarization of tools and interface of the selected program identified is applied to meet creative and technical requirements. 3.2. ***File organization***: (naming convention, hierarchies and data base structure) system are labeled based on parts and details. 3.3. 3D models are appropriately identified according to type, tools and techniques required based on concept design and model sheet. 3.4. ***3D Models*** produced are completed with relevant details from technical requirements and ***specifications***. 3.5. 3D Models produced are complied with the design provided in the ***model sheet***.	3.1 Verbal communication 3.2 Written communication 3.3 OHS Standards and 5S principles 3.4 Intellectual Property Rights concerns 3.5 OHS processes and procedure for Computer Hardware 3.6 Physical and Life Sciences 3.7 Human Anatomy parts and terminologies 3.8 Architectural and Structural concept 3.9 Use of 2D, 3D and photo editing software user interface and its major tools. 3.10 Cross platform data transfer 3.11 Internet browsing 3.12 Occupational Safety and Health Standards Management (OHS) related to use of Computer 3.13 Constructive Solid Geometry for Basic shapes 3.14 Implicit Surfaces 3.15 Subdivision Surfaces	3.1 3D Modeling skills 3.2 Effective Communication skills 3.3 Observation Skills 3.4 Presentation skills 3.5 Polygonal and Curve modeling skills 3.6 Demonstration Skills 3.7 Practicing OSHS, EHSM, 3Rs and 5S
4. Unwrap topology	4.1 Projection mapping is identified based on **design specification and** 3D model provided. 4.2 Seam is cut and divided in accordance to texture assignment 4.3 Seam is unfolded in texture editor 4.4 UV layout is exported from texture editor	4.1 Verbal communication 4.2 Written communication 4.3 OHS Standards and 5S principles 4.4 OHS processes and procedure for Computer Hardware 4.5 Physical and Life Sciences 4.6 Human Anatomy parts and terminologies 4.7 Architectural and Structural concept 4.8 Mapping	4.1 3D Modeling skills 4.2 3D UV mapping skills 4.3 Effective Communication skills 4.4 Observation Skills 4.5 Presentation skills 4.6 Polygonal and Curve modeling skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		4.9 Use of 2D, 3D and photo editing software user interface and its major tools. 4.10 Cross platform data transfer 4.11 Internet browsing 4.12 Occupational Safety and Health Standards Management (OHS) related to use of Computer 4.13 Constructive Solid Geometry for Basic shapes 4.14 Implicit Surfaces 4.15 Subdivision Surfaces	4.7 Demonstration Skills 4.8 Practicing OSHS, EHSM, 3Rs and 5S
5. Edit/revise 3D Models	5.1. Corrections to 3D models are addressed and reviewed in accordance to standards required by relevant personnel. 5.2. 3D models are clearly relabeled based on ***revision notes*** 5.3. Revised/ Final models' file organization are checked and are securely stored in accordance with company ***procedures***	5.1. Verbal communication 5.2. Written communication 5.3. OHS processes and procedure for Computer Hardware 5.4. Physical and Life Science 5.5. Human and Animal Anatomy and Physiology 5.6. Architectural and Structural concept 5.7. Industrial and Mechanical concept 5.8. Use of 3D editing software's user interface and its major tools. 5.9. Cross platform data transfer 5.10. Internet browsing 5.11. Occupational Safety and Health Standards Management (OHS) related to use of Computer 5.12. Constructive Solid Geometry 5.13. Implicit Surfaces 5.14. Subdivision Surfaces	5.1. 3D Modeling skills 5.2. Effective Communication skills 5.3. Presentation skills 5.4. Polygonal and Curve Modeling Skills 5.5. Practicing OSHS, EHSM, 3Rs and 5S

RANGE OF VARIABLES

VARIABLE	RANGE
1. Design Brief	May include: 1.1. Aim 1.2. Objective 1.3. Milestone 1.4. Time constraints – completion date 1.5. Technical constraints – limits of available technology 1.6. Design requirements 1.7. Storyboard
2. Creative and technical requirements for production	May include: 2.1. Concept art may include: 2.1.1. character design 2.1.2. props design 2.1.3. object design 2.1.4. environment design 2.1.5. mechanical design 2.1.6. architectural design 2.1.7. structural design 2.2. Storyboard 2.3. Model sheet 2.4. Layout drawings 2.5. Director's instructions/notes
3. References and sources	May include: 3.1. Model sheets 3.2. Story board 3.3. Reference images from internet 3.4. 3D references 3.4. Photo references with orthographic views
4. Relevant personnel	May include: 4.1. Director 4.2. Producer 4.3. Project manager 4.4. Technical Director 4.5. Navigation designers 4.6. Video producer 4.7. Editing personnel 4.8. 3D graphic, animation and modeling production personnel 4.9. Supervisor 4.10. Team Leader
5. Production specifications	May include: 5.1 Timeline 5.2 Budget 5.3 Deadline 5.4 Hardware 5.5 Software 5.6 Delivery platform 5.7 Internet access

VARIABLE	RANGE
	5.8 Production pipeline 5.9 Manpower
6. Equipment	May include: 4.1. Personal Computer 4.2. Mac Desktop Computer 4.3. Laptop
7. Required Peripherals	May include: 7.1 Pen Tablet 7.2 Three mouse button or with scroller 7.3 Digital Camera or Cellphone Camera 7.4 USB Flash drive / External Drive 7.5 Scanner 7.6 Printer 7.7 AVR
8. Model sheet	May include: 8.1. Size Comparison 8.2. Spatial Relationship 8.3. Turn around – front, side and back view 8.4. Design details and information 8.5. Mood board 8.6. Expressions 8.7. Gestures 8.8. Poses
9. 3D animation software	May include: 9.1. Autodesk Maya 9.2. 3D Studio Max 9.3. Blender 3D 9.4. Maxon's Cinema 4D 9.5. NewTek by the Foundry 9.6. Zbrush 9.7. Mudbox
10. Delivery platform	May include: 10.1. World wide web 10.2. CD-ROM/DVD/Any external storage system 10.3. Film 10.4. Broadcast format
11. 3D Models	May include: 11.1. Character/s 11.2. Props 11.3. Environment
12. Specifications	12.1. Topology 12.2. Edge flow 12.3. Polygon count 12.4. Level of details

VARIABLE	RANGE
13. File Organization	Must include: 13.1. Proper naming of 3D scene file 13.2. Object Naming Convention 13.3. Object hierarchies 13.4. Proper data base structure
14. Revision notes	14.1. Corrections 14.2. Comments 14.3. Feedback
15. Procedures	15.1. Proper naming of 3D objects and scene file 15.2. Hierarchy 15.3. Orientation of axis 15.4. Placement of object center 15.5. Object history 15.6. Unnecessary objects are deleted 15.7. Size and measurement 15.8. File formats

EVIDENCE GUIDE

1. Critical Aspect of Competency	Assessment require evidence that the candidate: 1.1 Identified all 3D modeling requirements including design brief, technical specifications, equipment and safety measurement. 1.2 Identified and selected the suitable 3D animation software in accordance with the specified delivery platform 1.3 Created 3D Models using appropriate model type, tools and technical features of the selected software to meet requirements 1.4 Unwrapped objects topology according to creative and technical requirements. 1.5 Edited the necessary revision to obtain quality standard of the project in compliance with the relevant personnel's instruction.
2. Method of Assessment	The assessor must assess the candidate through the following: 2.1 Demonstration with oral questioning 2.2 Interview 2.3 Portfolio
3. Resource Implication	The following resources should be provided: 3.1 Appropriate supplies and materials 3.2 Applicable equipment and peripherals 3.3 Workplace/Assessment area
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT TITLE : APPLY SHADER AND TEXTURE ON 3D MODELS
UNIT CODE : ICT 216309
UNIT DESRIPTOR : This unit covers the knowledge, skills and attitude required to create shader and texture on 3D model with basic lighting.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify 3D shading and texturing requirements	1.1 Object shading and texturing creative requirements including ***production specifications*** are identified and discussed with ***relevant personnel*** based on the ***creative requirements*** 1.2 Shading and texturing tools and techniques are identified relevant to the ***3D Models***, ***creative*** and ***technical requirements*** 1.3 ***Required peripherals*** and ***equipment*** to be used are identified and prepared according to task to be undertaken.	1.1 Oral communication 1.2 Written communication 1.3 Principles of Design 1.4 Color Theory 1.5 Copyright laws and regulation 1.6 Basic photography 1.7 Anatomy and Physiology 1.8 Geographical and topology mapping 1.9 Techniques and Methods of 3D shader and texture 1.10 Application of basic lighting for 3D shading and texturing 1.11 2D, 3D and photo editing software's user interface and its major tools. 1.12 Practicing 3R's – o Reduce, Re-use, Recycle/recover and environmental policies. 1.13 Geometry 1.14 Algebra	1.1 Design and Drawing skills for both living and non-living 1.2 Preparing image or texture skills 1.3 Effective Communication skills 1.4 Presentation skills 1.5 Computer operation skills 1.6 Photo editing skills 1.7 Practicing OSHS, EHSM, 3Rs and 5S
2. Gather different shader and texture references	2.1 Creative and technical requirements are determined to the specific 3D Models for texturing purposes. 2.2 Texture references and sources are gathered or simulated based on approved design. 2.3 Photo editing software and required peripherals are used for modifying textures	2.1 Verbal communication 2.2 Written communication 2.3 OHS Standards 2.4 OHS processes and procedure for Computer Hardware 2.5 Anatomy and Physiology 2.6 Geographical and topology mapping 2.7 Familiarization of 3D texturing tools, photo-editing software's user interface, and its major tools.	2.1 Drawing and design skills 2.2 Observation and analytical skills 2.3 Effective Communication skills 2.4 Presentation skills 2.5 Research and data gathering skills 2.6 Photo and video capture skills 2.7 Photo editing skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		2.8 Cross platform data transfer 2.9 Internet browsing 2.10 Practicing 3Rs – o Reduce, Re-use, Recycle/recover and environmental policies.	
3. Create UV mapping and shading	3.1 UV map projection are checked and edited according to creative and technical requirements. 3.2 Shading nodes are identified, applied and manipulated for specific object material. 3.3 Shaded models are render tested with basic lighting.	3.1 Verbal communication 3.2 Written communication 3.3 OHS processes and procedure for Computer Hardware 3.4 3D UV mapping 3.5 3D shading 3.6 Basic lighting 3.7 photo editing software tools 3.8 Cross platform data transfer 3.9 Internet browsing 3.10 Practicing 3Rs – o Reduce, Re-use, Recycle/recover and environmental policies 3.11 Geometry 3.12 Pole coordinates 3.13 Mapping	3.1 Drawing and design skills 3.2 Observation and analytical skills 3.3 Effective Communication skills 3.4 Presentation skills 3.5 Research and data gathering skills 3.6 Photo editing skills 3.7 UV mapping skills 3.8 3D Texturing skills 3.9 3D Lighting skills 3.10 Rendering skills
4. Create texture map	4.1 Tools and features of the selected program are identified and applied to meet ***creative and technical requirements.*** 4.2 Models are set-up for texture and lighting 4.3 UV map is exported to image editing software for creating texture in accordance to precise detail specification 4.4 Pre-defined images are applied as texture using ***texture mapping parameters*** as required based on design 4.5 Images are test rendered with proper ***lighting*** to preview the effect of pre-defined texture applied on the 3D Model.	4.1 Verbal communication 4.2 Written communication 4.3 OHS Standards 4.4 OHS processes and procedure for Computer Hardware 4.5 3D texturing process 4.6 Image editing software tools 4.7 Cross platform data transfer 4.8 Internet browsing 4.9 Practicing 3Rs – o Reduce, Re-use, Recycle/recover and environmental policies 4.10 Geometry 4.11 Pole coordinates 4.12 Mapping	4.1 Drawing and design skills 4.2 Observation and analytical skills 4.3 Effective Communication skills 4.4 Presentation skills 4.5 Research and data gathering skills 4.6 Image editing skills 4.7 UV mapping skills 4.8 3D Texturing skills 4.9 3D Lighting skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	4.6 Back-ups of texture images are prepared, labeled and stored in accordance with company procedures and industry standards of ***documentation***.		4.10 Rendering skills
5. Test and evaluate 3D Textures	5.1. 3D Texture cross platform image transfers and interface calibration is ensured to meet the requirements of technical and creative specifications. 5.2. UV texture mapping test is used to check distortions on 3D surface. 5.3. Proper lighting to render 3D models are presented to relevant personnel for review, comments and recommendations for the scene environment. 5.4. Identified changes are discussed with the relevant personnel in accordance to agreements incorporated to the prepared models and texture. 5.5. Image texture is revised and refined using photo editing software based on technical requirements 5.6. Final agreement and approval is obtained from relevant personnel for the final rendered models with texture based on company standard operating procedure.	5.1 Verbal communication 5.2 Written communication 5.3 OHS Standards 5.4 OHS processes and procedure for Computer Hardware 5.5 3D texturing process 5.6 photo editing software tools 5.7 Cross platform data transfer 5.8 Internet browsing 5.9 Practicing 3Rs – o Reduce, Re-use, Recycle/recover and environmental policies 5.10 Geometry 5.11 Pole coordinates 5.12 Mapping	5.1 Drawing and design skills 5.2 Observation and analytical skills 5.3 Effective Communication skills 5.4 Presentation skills 5.5 Research and data gathering skills 5.6 Photo editing skills 5.7 UV mapping skills 5.8 3D Texturing skills 5.9 3D Lighting skills 5.10 Rendering skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Relevant personnel	May include: 1.1 Director 1.2 Producer 1.3 Project manager 1.4 Technical Director for Texturing 1.5 Designers 1.6 Supervisor 1.7 Editing personnel 1.8 3D graphic, animation and modeling production personnel
2. Production specifications	May include: 2.1. Timeline 2.2. Budget 2.3. Deadline 2.4. Hardware
3. Creative requirements	May include: 3.1 character design 3.2 props design 3.3 object design 3.4 environment design 3.5 mechanical design 3.6 architectural design 3.7 structural design 3.8. Storyboard 3.9. Model sheet 3.10. Layout drawings 3.11. Director's instructions 3.12. Soundtrack/lip synch breakdown 3.13. Color key
4. References and sources	May include: 4.1. 2D flat bitmap images from internet 4.2. 3D books 4.3. Photos taken from an orthographic point of view 4.4.1. Top view 4.4.2. Front view 4.4.3. Right side view 4.4.4. Left side view 4.4.5. Back view
5. 3D Models	May include: 5.1. Character 5.2. Props 5.3. Objects 5.4. Environment

VARIABLE	RANGE
6. Required Peripherals	May include: 6.1. Pen Tablet 6.2. Digital Camera or Cellphone Camera 6.3. USB Flash drive or External hard drive 6.4. Scanner 6.5. Printer
7. Equipment	May include: 7.1 Personal Computer 7.2 Mac Desktop Computer 7.3 Laptop 7.4 Camera 7.5 Calibrated monitor 7.6 Three mouse button 7.7 AVR
8. Photo editing software	May include: 8.1. Adobe Photoshop 8.2. Paint Tool SAI 8.3. Corel Draw 8.4. Paint Shop 8.5. Manga Studio 8.6. Gimp 8.7. Krita
9. Delivery platform	Delivery platform may include: 9.1. World wide web 9.2. CD-ROM/ DVD 9.3. External hard drive/ USB drive
10. Texture mapping parameters	10.1. Lighting effect to an object 10.2. Shading effect to the given light 10.3. Level of details 10.4. No distortion on texture details 10.5. Render still
11. Documentation	Documentation may be: Computer-generated 11.1 Manually written 11.2 Marked up transcripts 11.3 Marked up scripts 11.4 Production schedules

EVIDENCE GUIDE

1. Critical Aspect of Competency	Assessment requires evidence that the candidate: 1.1 Identified 3D shading and texture requirements according to both creative and technical specifications. 1.2 Gather different shader and texture for reference 1.3 Create UV mapping and shading according to level of details needed in production 1.4 Created 3D Texture map using appropriate tools and features of the selected software to meet requirements 1.5 Test and evaluate textures to obtain quality standard of the project in compliance with the relevant personnel's instruction.
2. Method of Assessment	The assessor must select two of the following to objectively assess the candidate: 2.1 Demonstration with oral questioning 2.2 Interview 2.3 Portfolio
3. Resource Implication	The following resources should be provided: 3.1 Appropriate supplies and materials 3.2 Applicable equipment 3.3 Workplace/Assessment area
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT TITLE : SET CHARACTER RIGGING
UNIT CODE : ICT 216310
UNIT DESRIPTOR : This unit covers the knowledge, skills and attitude required to interpret the animation specifications to produce character and object rigs for animation production.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify 3D model characterization	1.1. Moving parts of ***3D Model*** are identified and grouped into ***sections*** based on approved design. 1.2. Attitude and behavior are assigned to 3D Models based on approved design.	1.1. Written communication 1.2. Oral communication 1.3. Anatomical Structure 1.4. Morphology 1.5. Physics 1.6. Kinematics 1.7. Behavioural Science 1.8. Physiology 1.9. Computer hardware and software 1.10. Internet Browsing	1.1. Observation and analytical skills 1.2. Communication skills 1.3. Presentation skills 1.4. Research and data gathering skills
2. Gather 3D model action references	2.1. ***Dynamic character references*** are gathered or simulated based on approved design. 2.2. Movement constraints are determined based on physical limitations.	2.1. Written communication 2.2. Oral communication 2.3. Kinematics 2.4. Morphology 2.5. Videography 2.6. Motion Capture 2.7. Photography 2.8. Internet Browsing	2.1. Observation and analytical skills 2.2. Communication skills 2.3. Presentation skills 2.4. Research and data gathering skills 2.5. Photo and video capture skills
3. Create joints for 3D models	3.1. ***Rigging specifications*** are applied based on the requirements of animation. 3.2. Joint parenting is applied with hierarchical structure based on technical requirements. 3.3. Naming convention system for joints is clearly labeled based on technical requirements 3.4. Created controllers are properly labeled and placed on corresponding joints based on design requirements 3.5. Specific constraints are assigned and applied to controllers and target object/s based on technical requirements.	3.1. The innovation of 3D animation software 3.2. Analysis of character movements and Interpreting the functions to 3D animation rigging platform 3.3. Algebra 3.4. Geometry 3.5. Trigonometry 3.6. Kinematics 3.7. Morphology 3.8. Physical Science 3.9. Life Science 3.10. Physiology 3.11. Videography 3.12. Motion Capture	3.1. Rigging skills 3.2. Presentation skills 3.3. Mathematical estimation skills 3.4. Computer operation skills 3.5. Effective communication skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.6. Rigged is tested for performance of model integrity and movement based on the design requirements.	3.13. Character Rig Engines	
4. Create blend/ morph shapes	4.1. Number of polygons are quantified and checked for consistency based on the design 4.2. Assets of blend /morph shapes are created based on design specification 4.3. Assets of blend /morph shapes are assigned to rigged model based on approved 3D model 4.4. Assets of blend /morph shapes are tested for movements based on approved 3D model 4.5. Model design is maintained during modification based on technical requirements.	4.1. Verbal communication 4.2. Written communication 4.3. Computer hardware 4.4. 3D animation software 4.5. Cross platform file transfer 4.6. Internet browsing 4.7. Physiology 4.8. Life Science	4.1. Effective communication skills 4.2. Listening skills 4.3. Observation skills 4.4. Testing and evaluation skills 4.5. Presentation skills 4.6. Computer operation skills 4.7. Blending and Morphing skills
5. Bind skin to rigged joints	5.1. ***Skin/bind weight*** mapping is applied to 3D Model based on technical requirements 5.2. Geometry is tested for model integrity based on design and animation requirements 5.3. Skin/bind weights are edited to correct value distribution based on technical requirements 5.4. Final testing is performed in preparation for animation process based on storyboard	5.1. Verbal communication 5.2. Written communication 5.3. Algebra 5.4. Geometry 5.5. Physiology 5.6. Life Science 5.7. Computer hardware 5.8. 3D animation software 5.9. Cross platform file transfer 5.10. Internet browsing	5.1. Effective communication skills 5.2. Observation skills 5.3. Testing and evaluation skills 5.4. Presentation skills 5.5. Computer operation skills 5.6. Binding skin skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. 3D Model	May include: 1.1. Character 1.2. Props 1.3. Environment
2. Sections	May include: 2.1 Facial Expressions 2.2 Body gestures 2.3 Story board actions 2.4 Mouth Openings 2.5 Eyeball Movements 2.6 Props
3. Dynamic character references	May include: 3.1 Live action 3.2 Animatics/Blocking 3.3 Story board 3.4 Video clips 3.5 Books 3.6 Online sources 3.7 Deformation references 3.8 Rigging references 3.9 Lip synch/ audio track file
4. Rigging specifications	May include: 4.1 Joint placement 4.2 Translation 4.3 Scale 4.4 orientation
5. Skin/bind weight	May include: 5.1. Painting skin/bind weight 5.2. Vertex skin/bind weight
6. 3D Animation Software's	May include: 6.1 Autodesk Maya 6.2 3D Studio Max 6.3 Blender 3D 6.4 Maxon's Cinema 4D 6.5 Houdini
7. Rig controllers	May include: 7.1 Simplified integration of joint hierarchy function 7.2 Adaptive integration of joint hierarchy

EVIDENCE GUIDE

1. Critical Aspect of Competency	Assessment requires evidence that the candidate: 1.1. Identified 3D model characterization 1.2. Gathered 3D model action references 1.3. Created joints for 3D models 1.4. Created blend and morphing shapes 1.5. Binded skin to rigged joints
2. Method of Assessment	The assessor must assess the candidate using the following: 2.1 Demonstration with oral questioning 2.2 Interview 2.3 Portfolio
3. Resource Implication	The following resources should be provided: 3.1 Appropriate supplies and materials 3.2 Applicable equipment 3.3 Workplace/Assessment area
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT TITLE : ANIMATE CHARACTER
UNIT CODE : ICT 216311
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to interpret the technical specifications and techniques to animate 3D objects and characters for animation production

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Gather action references	1.1 ***Source references*** and ***assets*** are gathered and obtained relevant to model character description. 1.2 Animation style movement and storyboard are discussed with ***relevant personnel*** based on company policies. 1.3 Technical parameters are included based on ***project descriptions*** based on technical requirements. 1.4 Animatics and blocking is identified based on client specifications 1.5 Audio for lipsync are recorded according to timing specified on the storyboard.	1.1 Oral communication 1.2 Written communication 1.3 Production list of reference materials 1.4 Internet resources 1.5 Client provided documents 1.6 Project discussions 1.7 Animal and human anatomy 1.8 Physics 1.9 Social behavior 1.10 Internet browsing	1.1 Effective communication skills 1.2 Computer operation skills 1.3 Research and data gathering skills 1.4 Software proficiency 1.5 Presentation skills
2. Create key poses	2.1 ***Key poses*** and expressions are created and placed strategically in the ***animation timeline*** according to scene duration. 2.2 ***Principles of animation*** are applied in accordance with scene requirements. 2.3 Key poses are evaluated and adjusted for clarity in accordance to storyboard description. 2.4 Lip-syncing action is applied based on dialogue soundtrack	2.1 Oral communication 2.2 Written communication 2.3 Lipsync reading 2.4 Storyboard text descriptions 2.5 Animal and human anatomy 2.6 Physics particularly Laws of Motion 2.7 Social behavior 2.8 Software Animation tools 2.9 Audio editing software Audio editing software	2.1 3D software proficiency 2.2 Manipulating rig 2.3 Animation graph editing skills 2.4 Action and acting skills 2.5 File conversion skills 2.6 Reading and Listening comprehension skills 2.7 Computer operation skills
3. Adjust and edit timing	3.1 Movement is edited based on notes. 3.2 Graph editor is used to edit and smoothen the action 3.3 Action poses are adjusted in relation with other elements involved in the scene based on design requirements 3.4 Result of revisions are reviewed in accordance to animation scene requirements.	3.1 Oral communication 3.2 Written communication 3.3 Lipsync transposed 3.4 to mouth action 3.5 Storyboard Action descriptions 3.6 Dope sheet information	3.1 Animation graph editing skills 3.2 Ability to enhance movement using rig controllers 3.3 Ability to enhance movement using graph editor

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		3.7 Animal and human anatomy applied in-between key poses 3.8 Physics applied between key poses particularly the Laws of Motion 3.9 Social behaviour 3.10 Voice acting 3.11 Action cycling	3.4 Intuitive decisions during the animation process 3.5 Ability to apply the 12 animation principles 3.6 Effective communication skills 3.7 Ability to apply phonetics for lipsynching 3.8 Ability to synchronize sound effects and music to animated objects 3.9 Ability to read dope sheet or exposure sheet 3.10 Ability to edit animation using dopesheet 3.11 Ability to edit animation using spreadsheet
4. Create animation preview	4.1 Appropriate ***camera view and movements*** are set for the scene based on storyboard requirements 4.2 Playback speed is set in real time in accordance to project frame rate requirement. 4.3 Preferences are set for the animation preview. 4.4 ***Video file format*** is determined in accordance to project requirements. 4.5 Final approval of test preview is acquired from relevant personnel based on company standard operating procedure. 4.6 Approved scenes are saved and submitted to designated production personnel based on company standard operating procedure.	4.1 Oral communication 4.2 Written communication 4.3 Directorial feedback 4.4 Hardware graphics renderer 4.5 Hardware Graphics 4.6 System 4.7 Video file-format	4.1 Ability to set the playback speed 4.2 Ability to set program for hardware rendering 4.3 Ability to optimize scene file for rendering 4.4 Ability to optimize software and hardware efficiency 4.5 Ability to convert raw file to video file format

RANGE OF VARIABLES

VARIABLE	RANGE
1. Source references	May include: 1.1. Video 1.2. Books 1.3. Online sources 1.4. Live action 1.5. 2D stock animation
2. Assets	May include: 2.1. Rigged models 2.2. Animatics/blocking 2.3. 3D stock animation 2.4. Animation library
3. Relevant personnel	May include: 3.1. Animation director 3.2. Technical director 3.3. Creative director 3.4. Supervisor
4. 12 principles of animation	May include: 4.1. Stretch and squash 4.2. Anticipation 4.3. Staging 4.4. Timing 4.5. Slow in/ Slow out 4.6. Arcs 4.7. Follow through and overlapping action 4.8. Straight ahead and pose to pose 4.9. Secondary actions 4.10. Exaggeration 4.11. Solid Drawings 4.12. Appeal
5. Project descriptions	May include: 5.1. Character description and personality 5.2. Model description and behavior 5.3. Project character associations with environment 5.4. Storyboard timing and blocking
6. Key poses	May include: 6.1. Dynamic action poses 6.2. Gestures and attitude poses 6.3. Anticipation poses 6.4. Extreme poses 6.5. Breakdown key poses
7. Animation timeline	May include: 7.1. Scene length information 7.2. Software animation graphic editor 7.3. Hardware playback 7.4. sound output

VARIABLE	RANGE
8. Timing	May include: 8.1. Dope sheet files 8.2. Sound files 8.3. Action references 8.4. Scene duration 8.5. Interaction with other models 8.6. Interactive rig controllers
9. Hardware test	May include: 9.1. Program hardware render playback 9.2. Conversion to video file 9.3. Software for video playback
10. Camera view	May include 10.1. Established camera object 10.2. Camera hardware shading 10.3. Orthographic or perspective views 10.4. Camera hardware quality levels
11. Production personnel	May include 11.1. Production manager/supervisor 11.2. Supervisor 11.3. Technical administrators
12. Video file format	May include 12.1. .Avi 12.2. .Mp4 12.3. .Mpg 12.4. .Wmv 12.5. .3GP 12.6. .H264 12.7. .DIVX 12.8. .XVID 12.9. .FLV 12.10. .MOV

EVIDENCE GUIDE

1. Critical Aspect of Competency	Assessment requires evidence that the candidate: 1.1. Gathered action references to obtain behavioral model description, animation style and technical parameters. 1.2. Created key poses that reflect the principles of animation and storyboard blocking and timing 1.3. Adjusted and edited timing that creates the illusion of life. 1.4. Rendered test Animation with correct playback speed and duration and converted to appropriate video format.
2. Method of Assessment	The assessor must assess the candidate using the following: 2.1 Demonstration with oral questioning 2.2 Interview 2.3 Portfolio
3. Resource Implication	The following resources should be provided: 3.1 Appropriate supplies and materials 3.2 Applicable equipment 3.3 3D animation software 3.4 Work area
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT TITLE : LIGHT AND RENDER ANIMATION SCENE
UNIT CODE : ICT 216312
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to produce the final rendered output of animated 3D scenes.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify rendering specifications	1.1. ***Software renderer*** is determined based on project requirements 1.2. Render settings is set and imported in the render properties based on ***technical requirements***. 1.3. Additional rendering requirements is checked based on project requirements.	1.1. Client quality specifications 1.2. Read from available renderer from manual's list 1.3. Numerical equality settings 1.4. Anatomy and Physiology	1.1. Ability to estimate rendering quality 1.2. Computer operation skills 1.3. Photo editing skills 1.4. Effective Communication skills 1.5. Presentation skills
2. Assemble scene elements.	2.1 Final animated scene file is opened for assembly based on the storyboard. 2.2 All relevant objects are gathered into the scene from ***project library*** and ***production assets*** based project requirements 2.3 All scene elements are arranged based on the storyboard.	2.1 Storyboard description 2.2 Geometry 2.3 Composition 2.4 File import 2.5 Scene assembly 2.6 File instancing 2.7 File referencing 2.8 Scene object layers	2.1 Ability to discern spatial relations between objects 2.2 Interpretation skills 2.3 Computer operation skills 2.4 Photo editing skills 2.5 Effective Communication skills 2.6 Presentation skills 2.7 Compositional skills
3. Add light sources to the scene	3.1. Types of light source/s are identified for proper 3.2. Light source/s are positioned based on scene requirements 3.3. Lit scene is previewed and checked base on scene requirements 3.4. Light source/s are edited based on revision notes. 3.5. Partial frame/s from scene are rendered for quality checks based project requirements. 3.6. Final approval is acquired from relevant personnel based on company policies.	3.1. Information on visual procedures 3.2. Production strategies 3.3. Documentation 3.4. Scene planning 3.5. Individual and collective rendering strategies 3.6. Image file formats 3.7. Video file formats. 3.8. Object grouping 3.9. Object hierarchies 3.10. Object layering	3.1. Rendering skills 3.2. Organizing skills 3.3. File management skills 3.4. Color profiling skills 3.5. Effective Communication skills 3.6. Presentation skills 3.7. Computer operation skills 3.8. Photography and Cinematography

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Plan and establish effective rendering procedures	4.1. Render type are identified according to project specification 4.2. ***Render passes*** and ***layers*** are identified according to creative and technical specification 4.3. Rendering schedules are checked based on hardware resources availability, production deadline and priority 4.4. ***Hardware limitations*** are determined and balanced for production efficiency based on technical requirements. 4.5. ***Color profile*** is managed for consistency in accordance with post production output specifications 4.6. Estimated render times per scene is calculated based on scene duration	4.1. Information on visual procedures 4.2. Production strategies 4.3. Documentation 4.4. Scene planning 4.5. Individual and collective rendering strategies 4.6. Multi-pass rendering 4.7. Image file formats 4.8. Video file formats. 4.9. Object grouping 4.10. Object hierarchies 4.11. Object layering	4.1. Rendering skills 4.2. Organizing skills 4.3. File management skills 4.4. Color profiling skills 4.5. Render Passes Skills 4.6. Shot breakdown skills 4.7. Effective Communication skills 4.8. Presentation skills 4.9. Computer operation skills
5. Perform full software render of animation scene or sequence	5.1 Scene is assigned to a production rendering schedule based on project requirements and priorities 5.2 Final ***rendering*** is executed on the designated rendering schedule based on design 5.3 Final rendered scene is saved and submitted to relevant personnel based on company policies.	5.1. Storyboard description 5.2. Production schedule 5.3. Software renderer 5.4. Raytracing 5.5. Ambient Occlusion 5.6. Global illumination 5.7. Photorealism 5.8. Image based lighting	5.1. Rendering skills 5.2. Effective communication skills 5.3. Observation skills 5.4. Testing and evaluation skills 5.5. Presentation skills 5.6. Computer operation skills.
6. Post edit rendered scenes	6.1. Final and rendered scene are edited in compositing software 6.2. Rendered scene are edited with audio as final movie	6.1. Storyboard description 6.2. Production schedule 6.3. Software renderer 6.4. Raytracing 6.5. Ambient Occlusion 6.6. Global illumination 6.7. Photorealism 6.8. Image based lighting	6.1. Basic Compositing skills 6.2. Basic Editing Skills 6.3. Effective communication skills 6.4. Observation skills 6.5. Testing and evaluation skills 6.6. Presentation skills 6.7. Computer operation skills.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Software renderer	May include: 1.1 Native software renderers 1.2 Third party software renderer 1.3 Render farms
2. Technical requirements	(camera ratio, image format and resolution, scene duration)
3. Project library	May include: 3.1 Client supplied objects 3.2 Pre-production objects 3.3 Project specific objects
4. Production assets	May include: 4.1 Marketplace acquired 4.2 In house models 4.3 Objects from other projects
3. Render passes	May include: 2.1. Ambient occlusion 2.2. Matte 2.3. Shadow 2.4. Beauty 2.5. Diffuse 2.6. Camera Z depth 2.7. Reflections 2.8. Specular 2.9. Special effects 2.10. Miscellaneous
4. layers	(foreground, mid-ground, background, character, props, incidentals
5. Hardware limitations	May include: 5.1 Number of CPU 5.2 Video graphic card 5.3 Computer memory (RAM) 5.4 Internal and external storage devices
6. Color profiles	May include: 6.1 Color management 6.2 Color spaces 6.2.1.1. SRGB 6.2.1.2. Adobe RGB 6.2.1.3. CIE lab 6.2.1.4. Monitor RGB 6.2.1.5. Desktop printer profile 6.2.1.6. CMYK

EVIDENCE GUIDE

1. Critical Aspect of Competency	Assessment requires evidence that the candidate: 1.1 Set rendering specifications for the specific scene 1.2 Assembled scene elements based on storyboard. 1.3 Added light sources to the scene 1.4 Planned and established effective rendering procedures. 1.5 Performed full software render of animation scene/sequence. 1.6 Composited the final rendered scene for final approval.
2. Method of Assessment	The assessor must assess the candidate using the following: 2.1 Demonstration with oral questioning 2.2 Third party report 2.3 Portfolio
3. Resource Implication	The following resources should be provided: 3.1 Appropriate supplies and materials 3.2 Applicable equipment 3.3 Workplace/Assessment area
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

SECTION 3 TRAINING STANDARDS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for **3D Animation NC III.**

They include information on curriculum design; training delivery; trainee entry requirements; tools and equipment; training facilities; and trainer's qualification.

3.1 CURRICULUM DESIGN

TESDA shall provide the training on the development of competency-based curricula to enable training providers develop their own curricula with the components mentioned below.

Delivery of knowledge requirements for the basic, common and core units of competency specifically in the areas of mathematics, science/technology, communication/language and other academic subjects shall be contextualized. To this end, TVET providers shall develop a Contextual Learning Matrix (CLM) to include green technology, issues on health and drugs and catering to persons with disabilities (PWD's) to accompany their curricula.

Course Title: 3D Animation **NC Level:** NC III

Nominal Training Duration:

68	hrs – Basic Competencies
28	hrs – Common Competencies
1,004	hrs– Core Competencies
Total	**1,100 hrs**

Course Description:

This course is designed to develop & enhance the knowledge, skills, & attitudes of a 3D Animator in accordance with animation industry standards. It covers the basic & common competencies in addition to the core competencies such as to produce key drawings for animation, create 3D digital animation and to use an authoring tool to create an interactive sequence.

The nominal duration of **1,100** hours covers the required units at 3D Animation NC III. TVET providers can however, offer a longer, ladderized course covering the NC III basic, common and core units.

To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES

(64 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

1. Lead workplace c**om**munication	1.1. Communicate information about workplace processes	• Lecture and discussion on:
		  ○ Effective verbal communication methods
		  ○ Sources of information
		• Practice organizing information
		• Identify organization requirements for written and electronic communication methods
		• Follow organization requirements for the use of written and electronic communication methods
		• Perform exercises on understanding and conveying intended meaning scenario
			• Lecture
			• Demonstration
			• Practical exercises
			• Demonstration
			• Role Play
				• Written Test
				• Observation
					2 Hours

	1.2. Lead workplace discussions	• Lecture and discussion on:
		  ○ Organizational policy on production, quality and safety
		  ○ Goals/ objectives and action plan setting
		• Read effective verbal communication methods
		• Prepare/set action plans based on organizational goals and objectives
			• Group discussion
			• Lecture
			• Demonstration
				• Oral evaluation
				• Written Test
				• Observation
					2 Hours

	1.3. Identify and communicate issues arising in the workplace	• Lecture and discussion on: ○ Organizational policy in dealing with issues and problems • Read effective verbal communication methods • Practice organizing information • Perform exercises on understanding and conveying intended meaning scenario	• Group discussion • Lecture • Demonstration • Role Play	• Oral evaluation • Written Test • Observation	2 Hours
2. Lead small team	2.1. Provide team leadership	• Lecture and discussion on: ○ Company policies and procedures • Identify client expectations • Practice team building skills • Perform exercises on communication skills required for leading teams	• Group discussion • Lecture • Demonstration • Role Play	• Oral evaluation • Written examination • Observation	2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	2.2. Assign responsibilities	• Lecture and discussion on: o Team member's duties and responsibilities • Identify client expectations • Practice negotiating skills • Perform group exercises showing the skills and techniques in promoting team building	• Group discussion • Lecture • Demonstration • Role Play	• Oral evaluation • Written examination • Observation	2 Hours

	2.3. Set performance expectations for team members	• Lecture and discussion on:
		  o Team member's duties and responsibilities
		  o How performance expectations are set
		• Identify client expectations
		• Perform group exercises in setting individual target/ expectation
		• Read instruction and requirements in up to date dissemination to members
			• Group discussion
			• Lecture
			• Demonstration
			• Role Play
				• Oral evaluation
				• Observation
				• Written examination
					2 Hours

	2.4. Supervise team performance	• Discuss listening and treating individual team members concern • Identify methods of Monitoring Performance • Perform group exercises showing the skills in monitoring team performance	• Group discussion • Lecture • Demonstration	• Oral evaluation • Written examination • Observation	2 Hours

3. Develop and practice negotiation skills	3.1. Plan negotiations	• Lecture and discussion on:
		  o codes of practice and guidelines for the organization
		  o differences between content and process
		• Read:
		  o Organizations policy and procedures for negotiations
		  o Decision making and conflict resolution strategies procedures
		  o Strategies to manage conflict
		  o Steps in negotiating process
		• Identify bargaining information
		• Apply strategies to manage process
		• Apply steps in negotiating process
			• Group Discussion
			• Lecture
			• Demonstration
				• Oral evaluation
				• Written examination
				• Observation
					4 hours

	3.2. Participate in negotiations	• Discuss/Describe the following strategies during negotiation:	• Group Discussion	• Oral evaluation	4 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		○ Decision making and conflict resolution strategies procedures ○ Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation • Practice the following scenarios in a group activity: ○ Perform interpersonal skills to develop rapport with other parties ○ Perform verbal communication and listening skill ○ observation skills ○ negotiation skills • Describe the Procedure in documenting negotiations • Apply a filing system in managing information • Demonstrate filing of documents	• Case studies • Demonstration • Simulation/ Role play	• Observation	
4. Solve workplace problems related to work activities	4.1. Identify the problem	• Discussion on Normal operating parameters & product quality • Identify & clarify the nature of problem • Read: ○ Brainstorming ○ Cause and effect diagrams ○ PARETO analysis ○ SWOT analysis ○ GANT chart ○ PERT CPM & graph ○ SCATTERGRAMS • Apply observation, investigation and analytical techniques in solving problem in the workplace	• Group discussion • Lecture • Demonstration	• Oral evaluation • Written examination • Observation	2 Hours
	4.2. Determine fundamental cause of the problem	• Discussion on Teamwork and work allocation problem • Read: ○ Using range of formal problem solving techniques ○ Enterprise goals, targets and measures ○ Enterprise quality, OHS and environmental requirement ○ Non-routine process and quality problems	• Group discussion • Lecture • Demonstration • Role Play	• Oral evaluation • Written examination • Observation	2 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Perform group exercises showing safety in emergency situations and incidents • Identify & clarify the nature of problem • Select relevant equipment and operational processes			
	4.3. Determine correct / preventive action	• Discussion on principles of decision making strategies and techniques • Read: o Evaluating the solution o Devising the best solution • Perform group exercise how to implement the developed plan to rectify a problem	• Group Discussion • Lecture • Demonstration • Role Play	• Oral evaluation • Written examination • Observation	2 Hour
	4.4. Provide recommendation to manager	• Discuss industry codes and standards • Apply enterprise information systems and data collation • Prepare recommendation letter	• Group Discussion • Demonstration	• Oral evaluation • Observation	2 Hour
5. Use mathematical concepts and techniques	5.1. Identify mathematical tools and techniques to solve problems	• Discussion on the four fundamental operation (addition, subtraction, division, multiplication) • Read: o Measurement system o Precision and accuracy o Basic measuring tools/devices • Apply mathematical computations • Demonstrate activities on: o Use of calculator o Use of different measuring tools	• Group Discussion • Lecture • Demonstration	• Oral evaluation • Written examination • Observation	2 Hour
	5.2. Apply mathematical procedures / solution	• Lecture and discussion on: o Estimation o Problem-based questions o Mathematical techniques • Apply mathematical computations • Demonstrate activities on: o Use of calculator o Use of different measuring tools o Use of mathematical tools and standard formulas	• Lecture • Demonstration • Simulation/ Role play	• Written examination • Observation	4 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

	5.3. Analyze results	• Discussion on the four fundamental operation (addition, subtraction, division, multiplication)
		• Read:
		  ○ Measurement system
		  ○ Precision and accuracy
		  ○ Basic measuring tools/devices
		• Apply mathematical computations
		• Demonstrate activities on:
		  ○ Use of calculator
		  ○ Use of different measuring tools
			• Group Discussion
			• Lecture
			• Demonstration
				• Oral evaluation
				• Written examination
				• Observation
					2 Hours

6. Use relevant technologies	6.1. Identify appropriate technology	• Discussion on company policy in relation to relevant technology
		• Read:
		  ○ Awareness on technology and its function
		  ○ Relevant technology application/ implementation
		  ○ Operating instructions
		• Practice basic communication skill in a group activity
			• Group Discussion
			• Lecture
			• Demonstration
			• Simulation/ Role Play
				• Oral evaluation
				• Written examination
				• Observation
					2 Hour

	6.2. Apply relevant technology	• Discussion on different management concepts
		• Read:
		  ○ Relevant technology application/ implementation
		  ○ Technology adaptability
		  ○ Different management concepts
		  ○ Health and safety procedure
		  ○ Communication techniques
		  ○ Apply software applications skills
		• Practice drills on installing application software
		• Practice basic communication skill in a group activity
			• Group Discussion
			• Lecture
			• Demonstration
			• Simulation/ Role Play
				• Oral evaluation
				• Written examination
				• Observation
					4 Hours

	6.3. Maintain/ enhance relevant technology	• Lecture and discussion on:
		  ○ Repair and maintenance procedure
		  ○ Operating instructions
		• Practice drills:
		  ○ Installing application software
		  ○ Basic troubleshooting skills
			• Lecture
			• Demonstration
			• Simulation/ Role Play
				• Written examination
				• Observation
					2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

7. Apply critical thinking and problem solving techniques in the workplace	7.1. Identify the problem	• Lecture and discussion on
		  ○ Processes, normal operating parameters, and product quality to recognize nonstandard situations
		  ○ Enterprise goals, targets and measures
		  ○ Analytical techniques
		  ○ Types of problems
			• Lecture
			• Group Discussion
				• Oral evaluation
				• Written Examination
					2 Hours

	7.2. Determine fundamental causes of the problem	• Lecture and collaboration on
		  ○ Root cause of the problem
		  ○ Problem solving tools
		• Exercise on cause and effect
			• Lecture
			• Group Discussion
				• Oral evaluation
				• Written Examination
				• Observation
					2 Hours

	7.3. Determine corrective action	• Lecture and discussion on
		  ○ Identification and analysis of possible options for problem resolution
		  ○ Corrective actions
		  ○ Principles of decision making strategies and techniques
		• Layouting of action plans
			• Lecture
			• Group Discussion
				• Oral evaluation
				• Written Examination
				• Observation
					2 Hours

	7.4. Provide recommendation/s to manager	• Using range of formal problem solving techniques • Preparation and presentation of sample recommendation report	• Lecture • Group Discussion	• Oral evaluation • Written Examination • Presentation	2 Hours

8. Use information creatively and critically	8.1. Use technical information systems and information technology	• Lecture and discussion on:
		  ○ Application in collating information
		  ○ Procedures for inputting, maintaining and archiving information
		  ○ Guidance to people who need to find and use information
		• Organizing information into a suitable form for reference and use
		• Classify stored information for identification and retrieval
		• Operate the technical information system by using agreed procedures
			• Lecture
			• Group Discussion
			• Self-paced handout/ module
			• Hands on
			• Demonstration
				• Oral evaluation
				• Written Examination
				• Presentation
					4 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	8.2. Apply information technology (IT)	• Lecture and discussion on: o Attributes and limitations of available software tool o Procedures and work instructions for the use of IT o Operational requirements for IT systems o Sources and flow paths of data o Security systems and measures that can be used o Methods of entering and processing information • Use procedures and work instructions for the use of IT • Extract data and format reports • Use WWW applications	• Lecture • Group Discussion • Self-paced handout/ module • Hands on • Demonstration	• Oral evaluation • Written Examination • Presentation	2 Hours
	8.3. Edit, format and check information	• Lecture and discussion on: o Basic file-handling techniques o Techniques in checking documents o Techniques in editing and formatting o Proof reading techniques • Use different techniques in checking documents • Edit and format information applying different techniques • Proof read information applying different techniques	• Lecture • Group Discussion • Self-paced handout/ module • Hands on • Demonstration	• Oral evaluation • Written Examination • Presentation	2 Hours
9. Work in a diverse environment	9.1. Develop an individual's cultural awareness and sensitivity	• Lecture and discussion on: o Enterprise policies and core values o Awareness on individual cultures and world geography o Different methods of verbal and non-verbal communication in a multicultural setting o Workplace Diversity Policy	• Lecture • Group Discussion	• Oral evaluation • Written Examination • Presentation	2 hrs
	9.2. Work effectively in an environment that acknowledges and values cultural diversity	• Lecture and discussion on: o The value of diversity in the economy and society in terms of Workforce development o Innovation o Social justice o Customer service excellence o Teamwork and collaboration • Applying strategies for customer service excellence	• Lecture • Group Discussion	• Oral evaluation • Written Examination • Presentation	2 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

	9.3. Identify common issues in a multicultural and diverse environment	• Lecture and discussion on:
		  ○ Diversity-related conflicts within the workplace
		  ○ Change management policies
		  ○ Advance strategies for customer service excellence
		• Identifying and addressing workplace harassment
		• Applying advance strategies for customer service excellence
			• Lecture
			• Group Discussion
				• Oral evaluation
				• Written Examination
				• Presentation
					2 hrs

Note: Basic competencies may be embedded in the core competencies.

COMMON COMPETENCIES
28 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
1. Apply Quality Standards	4.1 Assess quality of received materials	• Identify relevant production processes, materials and products • Study and interpret characteristics of materials, software and hardware used in production processes • Perform quality checking procedures • Apply quality Workplace procedures • Identify faulty materials • Check quality of materials or component parts as per manufacturer's standards • Interpret specifications or symbols	• Lecture • Field trip • Symposium • Video clips • Simulation/ Role playing	• Written test • Demonstration & questioning • Observation & questioning	3 hours
	4.2 Assess own work	• Perform workplace procedure in documenting completed work • Perform fault identification and reporting • Observe safety and environmental aspects of production processes • Utilize workplace quality indicators • Document and report deviations from specified quality standards	• Field trip • Symposium • Simulation • On the job training	• Demonstration & questioning • Observation & questioning	3 hours
	4.3 Engage in quality improvement	• Participate in quality improvement processes a. IEC/ISO standards b. Environmental and safety standards • Carry out work as per process improvement procedures • Monitor operation performance • Implement continuous improvement	• Field trip • Symposium • Simulation • On the job training	• Demonstration & questioning • Observation & questioning	2 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
2. Perform Computer Operations	1.1 Plan and prepare for task to be undertaken	• Plan and prepare computer operation activity • Determine task requirements based on required output • Determine appropriate hardware and software • Identify/Select types of computers and basic features of different operating systems • Interpret and follow client-specific guidelines & procedures • Plan task as per data security guidelines	• Lecture • Modular • Computer based training (e-learning) • Project method • On the job training	• Written/Oral examination • Practical demonstration	4 hours
	1.2 Input data into computer	• Apply basic ergonomics of keyboard and computer user • Enter/Encode data using appropriate computer programs/applications • Check accuracy of encoded data/information per SOP • Save and store inputted data in storage media • Storage devices and basic categories of memory • Identify and define relevant types of software	• Lecture • Modular • Group discussion • Project method • On the job training	• Written/Oral examination • Practical demonstration	4 hour

	1.3 Access information using computer	• Select correct program/ application based on job requirements
		• Access computer data/files
		• Interpret general security, privacy legislation & copyright
		• Use Productivity Application
		  ○ Microsoft office applications
		• Learn Business Application
		  ○ *Introduction* to Basic Programming software
		• Apply basic ergonomics of keyboard and computer user
			• Lecture
			• Computer based training (e-learning)
			• On the job training
				• Written/Oral examination
				• Practical demonstration
					5 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

	1.4 Produce/output data using computer system	• Identify types and function of computer peripheral devices
		• Print and scan office documents and materials
		• Send office/ business documents through facsimile
		• Transfer files or data between compatible systems using computer software, hardware/ peripheral devices
		• Save documents in storage devices
		  o CD/DVD
		  o USB drives
		  o Hard disk drives
			• Lecture
			• Group discussion
			• Modular
			• On the job training
				• Written/Oral examination
				• Practical demonstration
					5 hour

	1.5 Maintain computer equipment and systems	• Perform computer equipment/ system basic maintenance procedures
		  o Perform basic file maintenance procedures
		  o Perform cleaning of PC parts/ hardware components
		  o Scan/Debug computer software and applications
		  o Perform cleaning and defragmentation of computer files
		  o Perform backup of computer files
		• Enumerate and define different types of computer viruses
			• Demonstration
			• Simulation
			• Modular
			• Video clips
			• Computer based training (e-learning)
				• Written/Oral examination
				• Practical demonstration
					2 hours

CORE COMPETENCIES

(1,004 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
1. Create 3D Models for Animation	1.1. Identify 3D Modeling requirements	• Identify design brief, and creative and technical requirements including production specifications and references with relevant personnel. • Identify and prepare all necessary equipment and required peripherals to be used according to task to be undertaken. • Identify soundtrack requirements for lip synch purposes and discuss with relevant personnel.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews/ Questioning • Presentation • Hands-on demonstration	8 hours
	1.2 Identify and select 3D animation software	• Identify range of industry standard 3D animation software including computer-assisted techniques for suitability. • Select appropriate 3D animation software to be used in consultation with the appropriate personnel to ensure that output met requirements. • Produce selected 3D animation software in accordance with the specified delivery platform.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Interviews / • Questioning • Presentation • Hands-on demonstration	4 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
	1.3. Create 3D models and images	• Prepare appropriate tools and features of the selected program and apply to meet creative and technical requirements. • Import and set up hand drawn images of character, props and background based on the approved creative and technical requirements by the relevant personnel. • Create model and set-up environment layout for 3D production as appropriate to the required 3D models, based on concept design and model sheet. • Model different kinds of 3D characters, props and simple background for production based on design brief and creative. • Complete 3D Models produced with relevant details from technical requirements and specifications. • Produce clean mesh of 3D Model's topology and edge flow based on model sheet and concept design. • Comply produced 3D model with the design provided in the model sheet. • Label properly naming convention based on parts and details. • Group and organize 3D model parts based on hierarchies. • Use the computer workstation correctly and meet Occupational Safety and Health Standards and Environmental Health and Safety Management.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Written exam • Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	118 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
	1.4. Unwrap topology	• Identify projection mapping based on ***design specification*** and 3D model provided. • Cut and divide seam in accordance to texture assignment • Unfold seam in texture editor • Export UV layout from texture editor	• Discussion • Viewing Multimedia • Actual demonstration	• Interviews / Questioning • Presentation • Hands-on demonstration	40 hours
	1.5. Edit/revise 3D Models	• Make 3D models checked and corrected and then show to relevant personnel. • Clearly label character, props and backgrounds. • Identify clearly and store securely and safely all 3D Models in accordance with company procedures. • Use the computer workstation correctly and meet the Occupational Safety and Health Standards and Environmental Health and Safety Management	• Discussion • Viewing Multimedia • Actual demonstration	• Interviews / Questioning • Presentation • Hands-on demonstration	70 hours
2. Apply shader and texture on 3D models	2.1. Identify 3Dshading and texturing requirements	• Identify all 3D Texturing technical requirements including production specifications and discuss with relevant personnel based on the creative requirements • Identify texturing tools and techniques relevant to the 3D Models, creative and technical requirements • Identify and prepare all required peripherals and equipment to be used according to task to be undertaken.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Written exam • Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	8 hours
	2.2. Gather different texture references	• Determine creative and technical requirements to the specific 3D Models for texturing purposes.	• Lecture • Discussion • Viewing Multimedia	• Practical Exam • Interviews / Questioning • Presentation	16 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
		• Gather or simulated texture references and sources based on approved design. • Use photo editing software and required peripherals for modifying textures	• Actual demonstration	• Hands-on demonstration	
	2.3. Create UV Mapping and shading	• Identify and apply appropriate tools and features of the selected program to meet creative and technical requirements. • Provide model and set-up environment layout for 3D production as appropriate to the required 3D Texture and lighting. • Use texture editor to project UV mapping based on the form and shape of the approved 3D Model. • Identify Hypershade or Material editor to apply different node materials on 3D Models based on the design. • Apply seamless and not stretched or deformed 2D and 3D texture on the surface. • Apply pre-defined textures using texture mapping parameters as required. • Use photo editing software as cross platform image transfer for editing selected texture image to achieve precise texture on the Model. • Render images with proper lighting to preview the effect of pre-defined texture applied on the 3D Model. • Prepare back-ups of texture images, then label and store in accordance with company procedures and industry standards of ***documentation***.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	46 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
	2.4. Create texture map	• Identify and apply tools and features of the selected program to meet creative and technical requirements. • Set-up models for texture and lighting • Export UV map to image editing software for creating texture in accordance to precise detail and specification. • Apply pre-defined images as texture using texture mapping parameters as required based on design • Render test images with proper lighting to preview the effect of pre-defined texture applied on the 3D Model. • Prepare, label and store back-ups of texture images in accordance with company procedures and industry standards of documentation.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	● Practical Exam ● Interviews / Questioning ● Presentation ● Hands-on demonstration	40 hours
	2.5. Test and evaluate 3D Textures	• Ensure 3D Texture cross platform image transfers and interface calibration to meet the requirements of technical and creative specifications. • Use UV texture mapping test to check distortions on 3D surface. • Use proper lighting to render 3D models with applicable textures are presented to relevant personnel for review, comments and recommendations for the scene environment. • Discuss identified changes if any, with the relevant personnel and incorporate agreements to the prepared models and texture.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	● Practical Exam ● Interviews / Questioning ● Presentation ● Hands-on demonstration	40 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
		• Use photo editing software to revise and refine image texture. • Obtain final agreement and approval from relevant personnel for the final rendered models with texture. • Integrate animated objects or characters with texture into static or moving backgrounds for testing texture precision on the topology.			
3. Set Character Rigging	3.1. Identify 3D model characterization	• Identify and group moving parts of 3D Model into sections based on approved design. • Attitude and behavior are assigned to 3D Model parts based on approved design.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	4 hours
	3.2. Gather 3D model action references	• Gather or simulated dynamic character references based on approved design. • Determine movement constraints based on physical limitations. • Store and label different animation references properly.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Interviews / Questioning • Presentation • Hands-on demonstration	8 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
	3.3. Create joints for 3D models	• Apply joint placement, translation, scale, and orientation on approved 3D Model. • Apply joint parenting with hierarchical structure • Clearly label naming convention system for joints. • Simplify, label and place properly control objects created on corresponding joints. • Assign specific constraints and apply to controllers and target object/s. • Test rig for performance of model integrity and movement.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	● Practical Exam ● Interviews / Questioning ● Presentation ● Hands-on demonstration	150 hours
	3.4. Create blend shapes/ morph shapes	• Quantify number of polygons and check for consistency. • Create assets of blend /morph shapes based on approved 3D model. • Assign assets of blend /morph shapes to rigged model. • Test assets of blend /morph shapes for movements. • Maintain model design during modification.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	● Practical Exam ● Interviews / Questioning ● Presentation ● Hands-on demonstration	16 hours
	3.5. Bind skin to rigged joints	• Apply skin weight mapping to 3D Model. • Test geometry for model integrity. • Edit skin weights to correct value distribution. • Perform final testing in preparation for animation process.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	● Practical Exam ● Interviews / Questioning ● Presentation ● Hands-on demonstration	52 hours
4. Animate Character	4.1. Gather action references	• Gather and obtain source references and assets relevant to model behavioral description. • Discuss animation style movement and storyboard with relevant personnel.	• Lecture • Discussion • Viewing Multimedia	● Interviews / Questioning ● Presentation ● Hands-on demonstration	16 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
		• Include technical parameters based on project descriptions.	• Actual demonstration		
	4.2. Create key poses	• Create key poses and expressions and place strategically in the animation timeline according to scene duration. • Apply the 12 principles of animation as per scene requirements. • Evaluate key poses and adjust for clarity in accordance to storyboard description.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	50
	4.3. Adjust and Edit timing	• Apply initial movement based on storyboard. • Apply lip-synching action based on dialogue soundtrack. • Apply objects with sound effects based on storyboard. • Provide breakdowns to enhance animation movement. • Edit in-betweens using animation principles to smoothen the flow of movement. • Adjust action poses in relation with other elements involved in the scene. • Test and edit result of movements in accordance to scene duration	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	150
	4.4. Create Animation preview	• Set appropriate camera view for the scene. • Set playback speed in real time according to project frame rate requirement. • Set preferences for the hardware renderer. • Determine video file format according to project requirements.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	16

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
		• Render and preview hardware test. • Acquire final approval of test preview from relevant personnel. • Save approved scenes and submit to designated production personnel.			
5. Light and render animation scene	5.1. Identify rendering specifications	• Determine software renderer for the project. • Set or import render settings in the render properties. • Check if there are additional rendering requirements needed in the scene.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	8 hours
	5.2. Assemble scene elements	• Open the final animated scene file for assembly based on the storyboard with audio file. • Gather all relevant objects into the scene from project library and production assets. • Arrange all scene elements based on the storyboard.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	8 hours
	5.3. Add light sources to the scene	• Identify Types of light source/s for proper • Position light source/s based on scene requirements • Preview lit scene and check based on scene requirements • Edit light source/s based on revision notes. • Render partial frame/s from scene for quality checks based project requirements. • Acquire final approval from relevant personnel based on company policies.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	40 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Approach	Nominal Duration
	5.4. Plan and establish effective rendering procedures.	• Check rendering schedules for hardware resources availability. • Identify production requirements for post-production editing. • Determine hardware limitations and balance for production efficiency. • Manage color profile for consistency with post production output specifications.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	8 hours
	5.5. Perform full software render of animation scene or sequence	• Calculate estimated render times per scene based on scene duration. • Assign the scene to a production rendering schedule. • Execute the final software rendering on the designated rendering schedule. • Save and store the final rendered scene then submit to relevant personnel.	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	8 hours
	5.6. Post edit rendered scenes	• Import the final rendered scene files from the project pipeline into a video compositing software. • Compose the files and enhance according to design brief. • Render a draft for preview based on the scene duration • Acquire final approval from relevant personnel. • Execute a final quality render and store in the production pipeline	• Lecture • Discussion • Viewing Multimedia • Actual demonstration	• Practical Exam • Interviews / Questioning • Presentation • Hands-on demonstration	80 hours

3.2 TRAINING DELIVERY

1. The delivery of training shall adhere to the design of the curriculum. Delivery shall be guided by the principles of competency-based TVET.

    a. Course design is based on competency standards set by the industry or recognized industry sector; (**Learning system is driven by competencies written to industry standards**)
    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;
    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.
    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;
    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence.
    f. Training program allows for recognition of prior learning (RPL) or current competencies;
    g. Training completion is based on satisfactory completion of all specified competencies not on the specified nominal duration of learning.

2. The competency-based TVET system recognizes various types of delivery modes, both on-and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities and their variations/components may be adopted singly or in combination with other modalities when designing and delivering training programs:

2.1 Institution- Based:

- Dual Training System (DTS)/Dualized Training Program (DTP) which contain both in-school and in-industry training or fieldwork components. Details can be referred to the Implementing Rules and Regulations of the DTS Law and the TESDA Guidelines on the DTP;

- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video, computer technologies or other modern technology that can be used to facilitate learning and formal and non-formal training. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

- The traditional classroom-based or in-center instruction may be enhanced through use of learner-centered methods as well as laboratory or field-work components.

2.2 Enterprise-Based:

- Formal Apprenticeship – Training within employment involving a contract between an apprentice and an enterprise on an approved apprenticeable occupation.

- Informal Apprenticeship - is based on a training (and working) agreement between an apprentice and a master craftsperson wherein the agreement may be written or oral and the master craftsperson commits to training the apprentice in all the skills relevant to his or her trade over a significant period of time, usually between one and four years, while the apprentice commits to contributing productively to the work of the business. Training is integrated into the production process and apprentices learn by working alongside the experienced craftsperson.

- Enterprise-based Training- where training is implemented within the company in accordance with the requirements of the specific company. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

2.3 Community-Based:

- Community-Based Training – short term programs conducted by non-government organizations (NGOs), LGUs, training centers and other TVET providers which are intended to address the specific needs of a community. Such programs can be conducted in informal settings such as barangay hall, basketball courts, etc. These programs can also be mobile training program (MTP).

3.3 TRAINEE ENTRY REQUIREMENTS

The trainees who wish to enter the course should possess the following requirements:

- Must have certificate of employment and/or endorsement from studio/employer, *for industry practitioner*
- Must have NC or either COC-1 or COC-2 of Animation NC II, *for non-industry practitioner*
- Must pass creative skills qualifying test given by institution
- Must be knowledge of at least one (1) graphic software

This list does not include specific institutional requirements such as educational attainment, appropriate work experience and others that may be required from the trainees by the school or training center delivering the TVET program.

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS

Recommended list of tools, equipment and materials for the conduct of training in 3D Animation NC III:

TOOLS		EQUIPMENT		MATERIALS	
Qty	Description	Qty.	Description	Qty.	Description
21	Operating system - minimum required version recommended in the 3D software	21 units	Computer desktop (with keyboard and 3-button mouse) - minimum hardware specification as recommended in the 3D software and AVR	2 reams	Typewriting paper
1	Internet Access	21 units	Ergonomic computer tables	1 dozen	Whiteboard marker (assorted colors)
		21 units	Chairs	2 pcs	Whiteboard eraser
		1 unit	LCD Projector	2 boxes	Lead pencil
21	Any of the following 3D Software*: - Maya - 3D Studio max - Softimage - Lightwave - Maxxon Cinema 4D - Blender	1 unit	Printer	1 box	eraser
		1 unit	Scanner	1 pc	sharpener
21	Any of the following graphics software*: - Adobe Photoshop - PaintTool SAI - Manga Studio - Corel Draw - Paint Shop	1 unit	Speakers		
21	Pen Tablet				
21	Earphones				
1	Digital Camera				
1	Whiteboard 4' X 8'				

* *Can be either educational, license and open-source software*

In cases where there are specialized tools, equipment and facilities that are not generally considered standard requirements or not absolute requisites for training, the industry working group or TESDA may provide guidelines or specific advice on such matters.

3.5 TRAINING FACILITIES

Based on class size of 20 students/trainees the space requirements for the teaching/learning and circulation areas are as follows:

TEACHING/LEARNING AREAS	SIZE IN METERS	AREA IN SQ. METERS	QTY	TOTAL AREA IN SQ. METERS
Lecture Area	5 x 8	40	1	40
Learning Resource Area	3 x 5	15	1	15
Wash ,Toilet & Locker Room	2 x 2	4	2	8
Total				63
Facilities / Equipment / Circulation**				20
Total Area				**83**

***** Area requirement is equivalent to 30% of the total teaching/learning areas***

Appropriate consideration should be given in providing and allocating work space, communications facilities, and the usual workplace amenities to ensure a proper learning environment. Where applicable, training shall be held or conducted in learning facilities in accordance with generally accepted industry standards and practice.

3.6 TRAINERS QUALIFICATIONS FOR 3D ANIMATION NC III

- Must be a holder of National TVET Trainer Certificate (NTTC) level I in 3D Animation NC III;
- Must have at least five (5)-years animation production industry experience within the last 7 years

3.7 INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency. The institutional assessment is administered by the trainer/assessor.

The result of the institutional assessment may be considered as evidence for the assessment for national certification.

SECTION 4. ASSESSMENT AND CERTIFICATION ARRANGEMENT

Competency Assessment is the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards.

The assessment process is based on evidence or information gathered to prove achievement of competencies. The process may be applied to an employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

SECTION 4. NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1 To attain the National Qualification of **3D Animation NC III**, the candidate must demonstrate competence in all the units listed in Section 1. Successful candidates shall be awarded a National Certificate III level signed by the TESDA Director-General.

4.2 The qualification of **3D Animation NC III** may be attained through:

4.2.1 Accumulation of Certificates of Competency (COCs) in all the following units of competencies:

COC-1. Create 3D Models for Animation

COC-2. Apply 3D Texture and Lighting on 3D Models

COC-3. Set Character Rigging

COC-4. Animate Character

COC-5. Composite and Render Animation Scene

Successful candidates shall be awarded a **Certificate of Competency (COC)** in each of the core units.

4.3 Upon accumulation and submission of all COCs acquired for all the relevant units of competency comprising this qualification, an individual shall be issued the corresponding National Certificate.

4.4 Assessment shall cover all competencies, with basic and common integrated or assessed concurrently with the core units of competency.

4.5 Any of the following are qualified to apply for assessment and certification:

4.5.1 Graduates of formal, non-formal and informal including enterprise-based training programs.

4.5.2 Experienced workers (wage employed or self-employed)

4.6 Existing National Certificates (NCs) and Certificates of Competency (COCs) of individuals in 3D Animation NCIII shall continue to be in effect until the said NCs and COCs will have expired. Individuals are advised to take the assessment for this amended/updated TR on or before the expiration of such certificates.

4.7 The guidelines on assessment and certification are discussed in detail in the "Operating Procedures on Assessment and Certification" and "Guidelines on the Implementation of the Philippine TVET Competency Assessment and Certification System (PTCACS)".

4.1. COMPETENCY ASSESSMENT REQUISITE

4.2.1 *Self-Assessment Guide*. The self-assessment guide (SAG) is accomplished by the candidate prior to actual competency assessment. SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment.

This document can:

a. Identify the candidate's skills and knowledge
b. Highlight gaps in candidate's skills and knowledge
c. Provide critical guidance to the assessor and candidate on the evidence that need to be presented
d. Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior to assessment.

4.2.2 *Accredited Assessment Center*. Only Assessment Center accredited by TESDA is authorized to manage the assessment activities of candidates for national certification.

4.2.3 *Accredited Competency Assessor*. Only competency assessor accredited by TESDA is authorized to assess the competencies of candidates for national certification.

ANNEX A. ICT COMPETENCY MAP – 3D ANIMATION NC III

BASIC COMPETENCIES

Receive and Respond to Workplace Communication	Work with Others	Demonstrate work values	Practice basic housekeeping procedures	Participate in Workplace Communication
Work in a Team Environment	Practice career professionalism	Practice occupational health and safety procedures	**Lead Workplace Communication**	**Lead Small Team**
Develop and practice negotiation skills	**Solve Problems Related to Work Activities**	**Use mathematical concepts and techniques**	**Use relevant technologies**	Utilize Specialist Communication Skills
Develop Team and Individuals	Apply Problem Solving Techniques in the Workplace	Collect, analyze and organize information	Plan and Organize Work	Promote environmental protection

COMMON COMPETENCIES

Apply Quality Standards	**Operate a Personal Computer**

CORE COMPETENCIES

Communicate effectively in a customer contact center	Render quality customer service	Utilize enterprise/ company technology	Conduct contact center campaign	Provide specialized support and assistance to customers
Lead a contact center work team	Manage the activities of a contact center work team	Use business technology	Use medical technology to carry out task	Produce text from audio transcription
Review/edit documents	Lead a team in delivering quality service	Apply traditional drawing techniques for animation	Produce traditional cleaned-up drawings	Produce traditional in-between drawings
Produce Traditional key poses/drawings for animation	Create 2D digital animation	Export Animation into Video file format	Produce digital cleaned-up drawings	Produce digital in-between drawings
Produce background designs	Composite and edit animation sequence	Create 3D digital animation	Produce storyboard for animation	Coordinate the production of animation
Produce over-all designs for animation	Produce key drawings for animation	**Create 3D models for animation**	**Apply 3D texture and lighting to 3D models**	**Set character rigging**
Create 2D digital animation	Produce cleaned-up and in-between drawings	Use an authoring tool to create an interactive sequence	**Animate character**	**Composite and render animation sequence**
Produce key drawings for animation	Utilize Software Methodologies	Develop Responsive Web Design	Create Interactive Websites (Using JavaScript)	Develop Website Backend Systems
Develop designs for a logo	Develop designs for print media	Develop designs for user experience	Develop designs for user interface	Develop designs for product packaging
Design booth and product/window display				

DEFINITION OF TERMS

GENERAL

1) **Certification -** is the process of verifying and validating the competencies of a person through assessment

2) **Certificate of Competency (COC)** – is a certification issued to individuals who pass the assessment for a single unit or cluster of units of competency

3) **Common Competencies** - are the skills and knowledge needed by all people working in a particular industry

4) **Competency** - is the possession and application of knowledge, skills and attitudes to perform work activities to the standard expected in the workplace

5) **Competency Assessment -** is the process of collecting evidence and making judgements on whether competency has been achieved

6) **Competency Standard (CS)** - is the industry-determined specification of competencies required for effective work performance

7) **Context of Assessment** - refers to the place where assessment is to be conducted or carried out

8) **Core Competencies - are** the specific skills and knowledge needed in a particular area of work - industry sector/occupation/job role

9) **Critical aspects of competency -** refers to the evidence that is essential for successful performance of the unit of competency

10) **Elective Competencies -** are the additional skills and knowledge required by the individual or enterprise for work

11) **Elements** - are the building blocks of a unit of competency. They describe in outcome terms the functions that a person performs in the workplace

12) **Evidence Guide** - is a component of the unit of competency that defines or identifies the evidences required to determine the competence of the individual. It provides information on critical aspects of competency, underpinning knowledge, underpinning skills, resource implications, assessment method and context of assessment

13) **Level -** refers to the category of skills and knowledge required to do a job

14) **Method of Assessment** - refers to the ways of collecting evidence and when evidence should be collected

15) **National Certificate (NC)** – is a certification issued to individuals who achieve all the required units of competency for a national qualification defined under the Training Regulations. NCs are aligned to specific levels within the PTQF

16) **Performance Criteria** - are evaluative statements that specify what is to be assessed and the required level of performance

17) **Qualifications** - is a cluster of units of competencies that meets job roles and are significant in the workplace. It is also a certification awarded to a person on successful completion of a course in recognition of having demonstrated competencies in an industry sector

18) **Range of Variables** - describes the circumstances or context in which the work is to be performed

19) **Recognition of Prior Learning (RPL)** – is the acknowledgement of an individual's skills, knowledge and attitudes gained from life and work experiences outside registered training programs

20) **Resource Implications -** refers to the resources needed for the successful performance of the work activity described in the unit of competency. It includes work environment and conditions, materials, tools and equipment

21) **Basic Competencies -** are the skills and knowledge that everyone needs for work

22) **Training Regulations (TR)** – refers to the document promulgated and issued by TESDA consisting of competency standards, national qualifications and training guidelines for specific sectors/occupations. The TR serve as basis for establishment of qualification and certification under the PTQF. It also serves as guide for development of competency-based curricula and instructional materials including registration of TVET programs offered by TVET providers

23) **Unit of Competency** – is a component of the competency standards stating a specific key function or role in a particular job or occupation; it is the smallest component of achievement that can be assessed and certified under the PTQF

SECTOR SPECIFIC

1. **Animation** – a simulation of movement created by displaying a series of pictures, or frames. Cartoons on television are one example of animation. Animation on computers is one of the chief ingredients of multimedia presentations. There are many software applications that enable you to create animations that you can display on a computer monitor.
2. **3D Animation** – the creation of moving pictures in a three-dimensional digital environment. This is done by sequencing consecutive images, or "frames", that simulate motion by each image showing the next in a gradual progression of steps, filmed by a virtual "camera" and then output to video by a rendering engine.
3. **Browser** – a software package that provides the user interface for accessing Internet, intranet and extranet Web sites.
4. **Computer** – a device that has the ability to accept data; internally store and execute a program of instructions; perform mathematical, logical, and manipulative operations on data; and report the results.
5. **Computer Terminal** – any input/output device connected by telecommunications links to a computer.
6. **Data** - objective measurements of the attributes (characteristics) of entities such as people, places, things, and events.
7. **Documentation** – a collection of documents or information.
8. **Edit** – to modify the form or format of data
9. **Ergonomics** - the science and technology emphasizing the safety, comfort, and ease of use of human-operated machines. The goal of ergonomics is to produce systems that are user-friendly: safe, comfortable and easy to use.
10. **Information** – data placed in a meaningful and useful context for an end user.
11. **Information and Communication Technology (ICT) -** refers to technologies associated with the transmission and exchange of data in the form of sound, text, visual images, signals or any combination of those forms through the use of digital technology. It encompasses such services as telecommunications, posts, multimedia, electronic commerce, broadcasting, and information technology.
12. **Quality Assurance –** methods for ensuring that information system are free from errors and fraud and provide information products of high quality.
13. **Simulation** - the process of imitating a real phenomenon with a set of mathematical formulas. Advanced computer programs can simulate weather conditions, chemical reactions, atomic reactions, and even biological processes.
14. **Software –** computer programs and procedures concerned with the operation of an information system.
15. **Standards –** measures of performance developed to evaluate the progress of a system toward its objectives
16. **System –** an assembly of methods, procedures, or techniques unified by regulated interaction to form an organized whole
17. **User- friendly** – a characteristic of human-operated equipment and systems that makes them safe, comfortable, and easy to use.

TRAINING REGULATIONS (TR)
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