

Assessment Evidence Guide

For

“CAD/CAM Technician”

Level-4

**Develop Basic 2D Modelling using CREO
Parametric/Solid Work**

(Formative Assessment)



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level:4	Version:01
Competency Standard Title: Develop Basic 2D Modelling using CREO parametric/solid work	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number:
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to develop different basic 2D models in CREO parametric/Solid Work per instruction given by assessor.</p> <p>And complete:</p> <ol style="list-style-type: none"> Knowledge assessment test (Written or Oral) Portfolios at the time of assessment (if any)
Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Select working plan for the given job</p> <p>Performance Criteria 2: Create the sketch as per requirement</p> <p>Performance Criteria 3: Apply offset feature to the given sketch</p> <p>Performance Criteria 4: Apply project feature to the given sketch</p> <p>Performance Criteria 5: Apply trim to the given sketch</p> <p>Performance Criteria 6: Apply fillet to the given sketch</p> <p>Performance Criteria 7: Apply dimension to the given sketch</p> <p>Performance Criteria 8: Apply perpendicular constraint to the given sketch entity</p> <p>Performance Criteria 9: Apply equal constraint to the given sketch entity</p> <p>Performance Criteria 10: Apply horizontal constraint to the given sketch entity</p>
	Portfolios required at the time of assessment (if any) for

Assessors Judgment Guide

Candidate Details	Name: Registration/Roll Number: Candidate Signature:.....
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Assessment Task 1		Description of Assessment Task 1		
		Candidate is required to develop different basic 2D models in CREO parametric/Solid Work per instruction given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Select working plan for the given job			
2.	Create the sketch as per requirement			
3.	Apply offset feature to the given sketch			
4.	Apply project feature to the given sketch			
5.	Apply trim to the given sketch			
6.	Apply fillet to the given sketch			
7.	Apply dimension to the given sketch			
8.	Apply perpendicular constraint to the given sketch entity			
9.	Apply equal constraint to the given sketch entity			
10.	Apply horizontal constraint to the given sketch entity			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		
Each Assessment Task (with performance criteria)				

Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Basic 2D Modelling using CREO parametric/solid work	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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Candidate Details	Name:..... Registration/Roll Number: Candidate Signature:.....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Explain difference between SolidWorks Creo?	
2. What is Creo design?	
3. What is SolidWorks designer?	
4. What are Sledworks skills?	

Assessment Evidence Guide

For

“CAD/CAM Technician”

Level-4

**Develop Basic 3D Modelling using CREO Parametric
/Solid**

(Formative Assessment)



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Basic 3D Modelling using CREO Parametric /Solid	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number:
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to create different 3D models using CREO Parametric /Solid as per instruction given by assessor</p> <p>And complete:</p> <ol style="list-style-type: none"> Knowledge assessment test (Written or Oral) Portfolios at the time of assessment (if any)
Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Extrude sketch as per given specification Performance Criteria 2: Apply extrude cut to remove material from given sketch Performance Criteria 3: Apply material to object as per specification. Performance Criteria 4: Apply revolve feature Performance Criteria 5: Edit the parameter of revolve feature Performance Criteria 6: Apply material to object as per specification. Performance Criteria 7: Apply thicken to the 3d model Performance Criteria 8: Apply slice feature to the 3d model Performance Criteria 9: Edit dimension of the given 3d model Performance Criteria 10: Edit features of the given 3D model Performance Criteria 11: Reorder feature in the given 3D model Performance Criteria 12: Edit references of the 3D model Performance Criteria 13: Apply pattern tool as per given specifications.</p>

Assessors Judgment Guide

(To be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

Candidate Details	Name: Registration/Roll Number: Candidate Signature:.....
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Assessment Task 1		Description of Assessment Task 1		
		create different 3D models using CREO Parametric /Solid as per instruction given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Extrude sketch as per given specification			
2.	Apply extrude cut to remove material from given sketch			
3.	Apply material to object as per specification.			
4.	Apply revolve feature			
5.	Edit the parameter of revolve feature			
6.	Apply material to object as per specification.			
7.	Apply thicken to the 3d model			
8.	Apply slice feature to the 3d model			
9.	Edit dimension of the given 3d model			
10.	Edit features of the given 3D model			
11.	Reorder feature in the given 3D model			
12.	Edit references of the 3D model			
13.	Apply pattern tool as per given specification			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Basic 3D Modelling using CREO Parametric /Solid	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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Candidate Details	Name: Registration/Roll Number: Candidate Signature:
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code: Signature of the Assessor:

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. SolidWorks short key Ctrl+ O for?	
2. SolidWorks short key Ctrl+ S for?	
3. SolidWorks short key Ctrl+ Z for?	

Assessment Evidence Guide

For

“CAD/CAM Technician”

Level-4

**Render 3D Model using Plugins in Sketch Up
(Formative Assessment)**



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Render 3D Model using Plugins in Sketch Up	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number:
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to render model in V Ray as per instructions given by assessor.</p> <p>Assessment Task 2: Candidate is required to render model using key shot for solid works as per instructions given by assessor.</p> <p>And complete:</p> <ol style="list-style-type: none"> Knowledge assessment test (Written or Oral) Portfolios at the time of assessment (if any)
Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Apply textures to the 3D model as specified</p> <p>Performance Criteria 2: Apply light to illuminate model to get the required scene of image.</p> <p>Performance Criteria 3: Apply shadow of 3D object according to the movement of light.</p> <p>Performance Criteria 4: Apply material to the object as per given requirement.</p> <p>Performance Criteria 5: Apply render to the model as per given requirement</p> <p>Performance Criteria 6: Add scene for different camera views to elaborate the model.</p>

	<p>Assessment Task 2</p> <p>Performance Criteria 1: Apply textures to the 3D model as specified</p> <p>Performance Criteria 2: Apply light to illuminate model to get the required scene of image.</p> <p>Performance Criteria 3: Apply shadow of 3D object according to the movement of light.</p> <p>Performance Criteria 4: Apply material to the object as per given requirement.</p> <p>Performance Criteria 5: Apply render to the model as per given requirement</p> <p>Performance Criteria 6: Add scene for different camera views to elaborate the model.</p>
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Assessors Judgment Guide

Candidate Details	Name: Registration/Roll Number: Candidate Signature:.....
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Each Assessment Task (with performance criteria)				
Assessment Task 1		Description of Assessment Task 1		
		render model in V Ray as per instructions given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Apply textures to the 3D model as specified			
2.	Apply light to illuminate model to get the required scene of image.			
3.	Apply shadow of 3D object according to the movement of light.			
4.	Apply material to the object as per given requirement.			
5.	Apply render to the model as per given requirement			
6.	Add scene for different camera views to elaborate the model.			

Each Assessment Task (with performance criteria)				
Assessment Task 2		Description of Assessment Task 2		
		render model using key shot for solid works as per instructions given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Apply textures to the 3D model as specified			
2.	Apply light to illuminate model to get the required scene of image.			
3.	Apply shadow of 3D object according to the movement of light.			
4.	Apply material to the object as per given requirement.			
5.	Apply render to the model as per given requirement			
6.	Add scene for different camera views to elaborate the model.			

Competent <input type="checkbox"/>	Not Yet Competent <input type="checkbox"/>
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Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Render 3D Model using Plugins in Sketch Up	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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candidate Details	Name:..... Registration/Roll Number: Candidate Signature:.....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Enlist any three benefits f V Ray rendering?	
2. Is V-Ray a plugin?	
3. Load V-Ray settings means?	

Assessment Evidence Guide

For

“CAD/CAM Technician”

Level-4

Develop Basic CNC Code for Lathe Machine
(Formative Assessment)



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Basic CNC Code for Lathe Machine	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to write and edit basic CNC lathe machine program as per instruction given by assessor.</p> <p>Assessment Task 2: Candidate is required to perform basic CNC lathe machine program as per instruction given by assessor.</p> <p>And complete:</p> <ol style="list-style-type: none"> 3. Knowledge assessment test (Written or Oral) 4. Portfolios at the time of assessment (if any)

Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Interpreted Drawings to produce program according to specifications.</p> <p>Performance Criteria 2: Calculate Cutting speed and feed rate based on cutting tool and material.</p> <p>Performance Criteria 3: Process / job / adjustment sheets are filled up with relevant machine, tool and raw material data.</p> <p>Performance Criteria 4: Calculate Coordinates for simple tool path or basic machining functions based on part or product to be produced.</p> <p>Performance Criteria 5: Develop standard Program for CNC lathe operations, in accordance with standard operating procedures.</p> <p>Performance Criteria 6: Simulate and edit Program according to standard operating procedures.</p> <p>Performance Criteria 7: Save Program according to standard operating procedures.</p> <p>Performance Criteria 8: Import Program to the machine according to standard operating procedures.</p>
	<p>Assessment Task 2</p> <p>Performance Criteria 1: Mount Work piece in accordance with standard operating procedures.</p> <p>Performance Criteria 2: Perform Basic CNC Lathe operations to produce component as programmed.</p> <p>Performance Criteria 3: Perform Corrective measures/adjustments according to the requirement (if necessary).</p> <p>Performance Criteria 4: Check and measure work pieces according to the Job.</p> <p>Performance Criteria 5: Mark, Record and Report defective work piece for proper action.</p>

Assessors Judgment Guide

(to be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

Candidate Details	Name:Registration/Roll Number: Candidate Signature:
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Assessment Task 1		Description of Assessment Task 1 write and edit basic CNC lathe machine program as per instruction given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Interpreted Drawings to produce program according to specifications.			
2.	Calculate Cutting speed and feed rate based on cutting tool and material.			
3.	Process / job / adjustment sheets are filled up with relevant machine, tool and raw material data.			
4.	Calculate Coordinates for simple tool path or basic machining functions based on part or product to be produced.			
5.	Develop standard Program for CNC lathe operations, in accordance with standard operating procedures.			
6.	Simulate and edit Program according to standard operating procedures			
7.	Save Program according to standard operating procedures.			
8.	Import Program to the machine according to standard operating procedures.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Assessment Task 2		Description of Assessment Task 2 perform basic CNC lathe machine program as per instruction given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Mount Work piece in accordance with standard operating procedures.			
2.	Perform Basic CNC Lathe operations to produce component as programmed.			
3.	Perform Corrective measures/adjustments according to the requirement (if necessary).			
4.	Check and measure work pieces according to the Job.			
5.	Mark, Record and Report defective work piece for proper action.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Basic CNC Code for Lathe Machine	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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Candidate Details	Name:Registration/Roll Number: Candidate Signature:
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:Assessor's code: Signature of the Assessor:.....

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. CNC stands for?	
2. How much abilities are need to develop basic CNC programming?	
3. What is the formula of CNC?	

Assessment Evidence Guide

For

“CAD/CAM Technician”

Level-4

Develop 3D Model in REVIT

(Formative Assessment)



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level:4	Version:01
Competency Standard Title: Develop 3D Model in REVIT	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number:
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to create and render 3D building model and create construction document as per instruction given by assessor.</p> <p>And complete:</p> <p>3. Knowledge assessment test (Written or Oral)</p> <p>4. Portfolios at the time of assessment (if any)</p>
Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Create and apply Families as per given specifications and requirements.</p> <p>Performance Criteria 2: Create/import drawings to make layout according to the given requirements.</p> <p>Performance Criteria 3: Create 3D prototype model of the drawing according to given measurements.</p> <p>Performance Criteria 4: Create specification/detail for various parts according to given requirements.</p> <p>Performance Criteria 5: Apply specified detail to objects according to given requirements.</p> <p>Performance Criteria 6: Annotate the drawings using set parameters as per given details.</p> <p>Performance Criteria 7: Add scene of 3D model according to specification</p>

	<p>Performance Criteria 8: Add lights for illumination to get the requisite scene of 3D model.</p> <p>Performance Criteria 9: Apply material to the 3D model as per given specification.</p> <p>Performance Criteria 10: Apply texture to 3D model as per given specification.</p> <p>Performance Criteria 11: Assign cameras to execute different views of 3D Model.</p> <p>Performance Criteria 12: Render the 3D model according to required image size or resolution & orientation.</p>
	Portfolios required at the time of assessment (if any) for

Assessors Judgment Guide

Candidate Details	Name: Registration/Roll Number: Candidate Signature:.....
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Assessment Task 1		Description of Assessment Task 1		
		Create and render 3D building model and create construction document as per instruction given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Create and apply Families as per given specifications and requirements.			
2.	Create/import drawings to make layout according to the given requirements.			
3.	Create 3D prototype model of the drawing according to given measurements.			
4.	Create specification/detail for various parts according to given requirements.			
5.	Apply specified detail to objects according to given requirements.			
6.	Annotate the drawings using set parameters as per given details.			
7.	Add scene of 3D model according to specification			
8.	Add lights for illumination to get the requisite scene of 3D model.			
9.	Apply material to the 3D model as per given specification.			
10.	Apply texture to 3D model as per given specification.			
11.	Assign cameras to execute different views of 3D Model.			
12.	Render the 3D model according to required image size or resolution & orientation.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		
Each Assessment Task (with performance criteria)				

Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop 3D Model in REVIT	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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Candidate Details	Name:..... Registration/Roll Number: Candidate Signature:.....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Wat are REVIT annotation families?	
2. What are the annotation categories in REVIT?	
3. What are REVIT annotation elements?	

Assessment Evidence Guide

For

“CAD/CAM Technician”

Level-4

**Conduct Quantity Estimation
(Formative Assessment)**



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Conduct Quantity Estimation	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number:
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to calculate area and quantities of project as per instruction given by assessor</p> <p>Assessment Task 2: Candidate is required to prepare bar bending schedule and BOQ as per instruction given by assessor</p> <p>And complete:</p> <ol style="list-style-type: none"> 1. Knowledge assessment test (Written or Oral) 2. Portfolios at the time of assessment (if any)
Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Calculate surface area of regular shapes.</p> <p>Performance Criteria 2: Convert complex surface area into regular areas.</p> <p>Performance Criteria 3: Calculate area of complex surface.</p> <p>Performance Criteria 4: Calculate volume of given object.</p> <p>Performance Criteria 5: Calculate execution.</p> <p>Performance Criteria 6: Calculate volume of concrete from given drawings.</p> <p>Performance Criteria 7: Calculate B/W (Brick Work) as per given drawing.</p> <p>Performance Criteria 8: Calculate Plaster as per the given requirement.</p> <p>Performance Criteria 9: Calculate material requirement for different projects.</p> <p>Performance Criteria 10: Calculate earth work. (Cut and fill) as per the Job requirement.</p> <p>Performance Criteria 11: Calculate Material requirement for Infrastructural Development Project.</p>

	<p>Assessment Task 2</p> <p>Performance Criteria 1: Identify number of steel bars.</p> <p>Performance Criteria 2: Calculate length of reinforcement bars</p> <p>Performance Criteria 3: Calculate unit weight of reinforcement bar</p> <p>Performance Criteria 4: Calculate weight of particular shape of bar</p> <p>Performance Criteria 5: Make bar bending schedule from given drawing.</p> <p>Performance Criteria 6: Make BOQ (Bill of Quantity) of Project</p>
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Assessors Judgment Guide

(To be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

Candidate Details	Name: Registration/Roll Number: Candidate Signature:.....
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Assessment Task 1		Description of Assessment Task 1 calculate area and quantities of project as per instruction given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Calculate surface area of regular shapes.			
2.	Convert complex surface area into regular areas.			
3.	Calculate area of complex surface.			
4.	Calculate volume of given object.			
5.	Calculate execution.			
6.	Calculate volume of concrete from given drawings			
7.	Calculate B/W (Brick Work) as per given drawing.			
8.	Calculate Plaster as per the given requirement.			
9.	Calculate material requirement for different projects.			
10.	Calculate earth work. (Cut and fill) as per the Job requirement.			
11.	Calculate Material requirement for Infrastructural Development Project.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Assessment Task 2		Description of Assessment Task 2		
		prepare bar bending schedule and BOQ as per instruction given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Identify number of steel bars.			
2.	Calculate length of reinforcement bars			
3.	Calculate unit weight of reinforcement bar			
4.	Calculate weight of particular shape of bar			
5.	Make bar bending schedule from given drawing.			
6.	Make BOQ (Bill of Quantity) of Project			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Conduct Quantity Estimation	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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Candidate Details	Name: Registration/Roll Number: Candidate Signature:
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code: Signature of the Assessor:

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. What is Bar Bending schedule?	
2. How is Bar bending schedule calculate?	
3. BOQ stands for?	

Assessment Evidence Guide For “CAD/CAM Technician” Level-4

**Develop Preliminary Project Plan
(Formative Assessment)**



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Preliminary Project Plan	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number:
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to develop preliminary project plan as per instructions given by assessor.</p> <p>And complete:</p> <ol style="list-style-type: none"> 1. Knowledge assessment test (Written or Oral) 2. Portfolios at the time of assessment (if any)
Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Perform reconnaissance survey of area for project. Performance Criteria 2: Perform topographic survey of area for project. Performance Criteria 3: Prepare map of area for project. Performance Criteria 4: Prepare rough cost estimate. Performance Criteria 5: Mark options on the prepared map. Performance Criteria 6: Select most suitable and economic site. Performance Criteria 7: Perform Detailed Survey. Performance Criteria 8: Prepare structural design of components of project. Performance Criteria 9: Prepare geometric design / drawings of project. Performance Criteria 10: Prepare working drawings of project. Performance Criteria 11: Work out quantities of items of work. Performance Criteria 12: Prepare cost estimate. Performance Criteria 13: Draft construction and system feasibility-resources for project. Performance Criteria 14: Estimate quantity of work, time, and available resources for project. Performance Criteria 15: Decide the feasibility and prepare feasibility report of project.</p>

Assessors Judgment Guide

Candidate Details	Name: Registration/Roll Number: Candidate Signature:.....
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Each Assessment Task (with performance criteria)				
Assessment Task 1		Description of Assessment Task 1 develop preliminary project plan as per instructions given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Perform reconnaissance survey of area for project.			
2.	Perform topographic survey of area for project.			
3.	Prepare map of area for project.			
4.	Prepare rough cost estimate.			
5.	Mark options on the prepared map.			
6.	Select most suitable and economic site.			
7.	Perform Detailed Survey.			
8.	Prepare structural design of components of project.			
9.	Prepare geometric design / drawings of project			
10.	Prepare working drawings of project.			
11.	Work out quantities of items of work.			
12.	Prepare cost estimate.			
13.	Draft construction and system feasibility-resources for project.			
14.	Estimate quantity of work, time, and available resources for project.			
15.	Decide the feasibility and prepare feasibility report of project.			

Competent <input type="checkbox"/>	Not Yet Competent <input type="checkbox"/>
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Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Preliminary Project Plan	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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candidate Details	Name:..... Registration/Roll Number: Candidate Signature:.....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. What is pre-feasibility of a project?	
2. What are the four types of feasibility analysis?	
3. What are the 6 components of a feasibility study?	

Assessment Evidence Guide

For

“CAD/CAM Technician”

Level-4

Develop Project Plan

(Formative Assessment)



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Project plan	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to develop project plan including:</p> <ul style="list-style-type: none"> ✓ Specify the individual activities. ✓ Determine the sequence of activities. ✓ Draw a network diagram. ✓ Estimate the completion time for each activity. <p>as per instruction given by assessor.</p> <p>And complete:</p> <ul style="list-style-type: none"> ✓ Knowledge assessment test (Written or Oral) ✓ Portfolios at the time of assessment (if any)

Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Collect data from estimate of project.</p> <p>Performance Criteria 2: Identify time dependency of activities- Dummy activities.</p> <p>Performance Criteria 3: Divide the work into smaller parts.</p> <p>Performance Criteria 4: Prepare the list of activities along with normal duration</p> <p>Performance Criteria 5: Identify the activities project.</p> <p>Performance Criteria 6: Find out predecessor and successor of each activity</p> <p>Performance Criteria 7: Represent each activity with arc/ line with an arrow.</p> <p>Performance Criteria 8: Draw ellipse/ circles at start and end of activities.</p> <p>Performance Criteria 9: Examine the resources for each activity.</p> <p>Performance Criteria 10: Estimate the workability of workforce</p> <p>Performance Criteria 11: Examine the productivity of machinery.</p> <p>Performance Criteria 12: Determine the activities normal duration.</p> <p>Performance Criteria 13: Write down time required to complete each activity.</p>
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Assessors Judgment Guide

(to be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

Candidate Details	Name:Registration/Roll Number: Candidate Signature:
Assessment Outcome	<div style="display: flex; justify-content: space-between;"> COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> </div> Name of the Assessor:Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Assessment Task 1	Description of Assessment Task 1 develop project plan including: <ul style="list-style-type: none"> ✓ Specify the individual activities. ✓ Determine the sequence of activities. ✓ Draw a network diagram. ✓ Estimate the completion time for each activity. 		
During the practical assessment, candidate demonstrated the following:	Yes	No	Remarks
1. Collect data from estimate of project.			
2. Identify time dependency of activities- Dummy activities.			
3. Divide the work into smaller parts.			
4. Prepare the list of activities along with normal duration			
5. Identify the activities project.			
6. Find out predecessor and successor of each activity			
7. Represent each activity with arc/ line with an arrow.			
8. Draw ellipse/ circles at start and end of activities.			
9. Examine the resources for each activity.			
10. Estimate the workability of workforce			
11. Examine the productivity of machinery.			
12. Determine the activities normal duration.			
13. Write down time required to complete each activity.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>	

Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop Project Plan	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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Candidate Details	Name:Registration/Roll Number: Candidate Signature:
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:Assessor's code: Signature of the Assessor:

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. What are the methods used in procurement?	
2. What are the steps of a Procurement?	
3. What are the 5P's in Procurement?	

Assessment Evidence Guide

For

“CAD/CAM Technician”

Level-4

Develop CPM for a Project Plan

(Formative Assessment)



**National Vocational & Technical
Training Commission**

Instruction Sheet for the Candidate

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level:4	Version:01
Competency Standard Title: Develop CPM for a Project Plan	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number:
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to develop CPM for a project plan as per instructions given by assessor.</p> <p>And complete:</p> <ol style="list-style-type: none"> Knowledge assessment test (Written or Oral) Portfolios at the time of assessment (if any)
Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <p>Performance Criteria 1: Perform forward pass by formula at each project activities.</p> <p>Performance Criteria 2: Perform backward pass by formula at each project activities.</p> <p>Performance Criteria 3: Level the resources of project.</p> <p>Performance Criteria 4: Apply constraints due to resources, time, environment, and season.</p> <p>Performance Criteria 5: Calculate float/ slack time for each activity.</p> <p>Performance Criteria 6: Decide the critical path of construction project-activities with zero float/ slack time.</p> <p>Performance Criteria 7: Calculate the duration of project for completion.</p> <p>Performance Criteria 8: Enhance workforce force and machinery for activities.</p> <p>Performance Criteria 9: Assess the impact of each on cost.</p> <p>Performance Criteria 10: Calculate critical durations for activities.</p> <p>Performance Criteria 11: Calculate time for completion of crash programming.</p>

	Performance Criteria 12: Record actual time duration during work. Performance Criteria 13: Assess the actual cost.
	Portfolios required at the time of assessment (if any) for

Assessors Judgment Guide

Candidate Details	Name: Registration/Roll Number: Candidate Signature:.....
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

Observation Checklist

Assessment Task 1		Description of Assessment Task 1		
		Develop CPM for a project plan as per instructions given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Perform forward pass by formula at each project activities.			
2.	Perform backward pass by formula at each project activities.			
3.	Level the resources of project.			
4.	Apply constraints due to resources, time, environment, and season.			
5.	Calculate float/ slack time for each activity.			
6.	Decide the critical path of construction project-activities with zero float/ slack time.			
7.	Calculate the duration of project for completion.			
8.	Enhance workforce force and machinery for activities.			
9.	Assess the impact of each on cost.			
10.	Calculate critical durations for activities.			
11.	Calculate time for completion of crash programming.			
12.	Record actual time duration during work.			
13.	Assess the actual cost.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		
Each Assessment Task (with performance criteria)				

Knowledge Assessment

Title of Qualification: National Certificate of level 4 in Computer Aided Design & Manufacturing (CAD/CAM Technician)	CS Code:	Level: 4	Version: 01
Competency Standard Title: Develop CPM for a Project Plan	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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Candidate Details	Name:..... Registration/Roll Number: Candidate Signature:.....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. What is CPM formula?	
2. What is standard CPM?	
3. What are the three categories of CPM?	