

# Computer Aided Product Design

Unit Code: ASC/N8114

Version: 1.0

NSQF Level: 5.5

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## Description

This NOS unit is about creating the design of vehicle components and systems by using appropriate computer graphic techniques and software.

## Scope

The scope covers the following :

- Prepare for product designing
- Perform designing of the component
- Perform post-designing activities

## Elements and Performance Criteria

### *Prepare for product designing*

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

- PC1.** obtain the vehicle component design requirements and specifications such as material used for making the component, packaging and other requirements to decide the dimensions, measurements and tolerances of the aggregate/component and instructions from the design team or supervisor
- PC2.** use designing software like CATIA, AutoCAD, Unigraphics etc. for creating the designs
- PC3.** refer any issues related to design concept clarity, dimensions and practicality to competent internal specialist or supervisor if they cannot be resolved by own

### *Perform designing of the component*

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

- PC4.** set the given specifications and dimension parameters of required product design in a CAD file
- PC5.** insert sketches, scanned images, diagrams, signs or symbols, etc. in the CAD file as per the design requirement
- PC6.** create a 3D model of product by using CAD techniques as per the design specifications and parameters received
- PC7.** prepare layouts and various views of drawing to generate a relationship between components and assemblies
- PC8.** apply different drawing/ drafting aids like colours, symbols etc. to highlight areas in the drawings
- PC9.** test the 3D model through simulation/ packaging study on the feasibility of actual product as per the customer requirement
- PC10.** create 2D drawing of the component as per the SOP/WI
- PC11.** maintain CAD files, backup of CAD files, notes and records related to design as per SOP

### *Perform post-designing activities*

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

- PC12.** submit the design to supervisor / design team for review and feedback
- PC13.** rework or modify the design on the 2D drawings as per the feedback received
- PC14.** tag and store the drawings with the right numbers and codes properly as per the organisational guidelines

## **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** relevant standards and procedures followed in the company
- KU2.** various requirements in terms of design and utility of the component
- KU3.** different types of designing processes and associated software like CATIA, AutoCAD, Unigraphics etc.
- KU4.** Draughting Standards & Techniques- e.g. ANSI series IS/ ISO
- KU5.** technical drawing practices as per the company standards
- KU6.** drawings and modelling techniques like 2D and 3D
- KU7.** different type of views generated in engineering drawings
- KU8.** computer programming and drafting
- KU9.** Limits & Fits, GD&T etc.
- KU10.** algebra and trigonometric rules and applications
- KU11.** how to interpret Tolerance Analysis sheet supplied by the design team
- KU12.** how to check various dimensional mismatches which may happen on the actual product assembly

## **Generic Skills (GS)**

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

- GS1.** read and interpret notes, designs and instructions shared by different internal team
- GS2.** communicate the process requirements to the supervisor and co-workers
- GS3.** attentively listen and comprehend the information given by the supervisor/team members
- GS4.** write work related information in English/regional language
- GS5.** recognise a workplace problem and take suitable action
- GS6.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS7.** plan and organise work according to the work requirements
- GS8.** complete the assigned tasks with minimum supervision
- GS9.** visualize designs
- GS10.** share technical information clearly using appropriate language

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for product designing</i>	<b>7</b>	<b>9</b>	-	<b>4</b>
<b>PC1.</b> obtain the vehicle component design requirements and specifications such as material used for making the component, packaging and other requirements to decide the dimensions, measurements and tolerances of the aggregate/component and instructions from the design team or supervisor	2	3	-	2
<b>PC2.</b> use designing software like CATIA, AutoCAD, Unigraphics etc. for creating the designs	3	4	-	1
<b>PC3.</b> refer any issues related to design concept clarity, dimensions and practicality to competent internal specialist or supervisor if they cannot be resolved by own	2	2	-	1
<i>Perform designing of the component</i>	<b>17</b>	<b>36</b>	-	<b>12</b>
<b>PC4.</b> set the given specifications and dimension parameters of required product design in a CAD file	3	5	-	2
<b>PC5.</b> insert sketches, scanned images, diagrams, signs or symbols, etc. in the CAD file as per the design requirement	3	5	-	2
<b>PC6.</b> create a 3D model of product by using CAD techniques as per the design specifications and parameters received	2	5	-	1
<b>PC7.</b> prepare layouts and various views of drawing to generate a relationship between components and assemblies	2	5	-	1
<b>PC8.</b> apply different drawing/ drafting aids like colours, symbols etc. to highlight areas in the drawings	2	5	-	1
<b>PC9.</b> test the 3D model through simulation/ packaging study on the feasibility of actual product as per the customer requirement	2	5	-	2
<b>PC10.</b> create 2D drawing of the component as per the SOP/WI	1	3	-	2
<b>PC11.</b> maintain CAD files, backup of CAD files, notes and records related to design as per SOP	2	3	-	1

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<i>Perform post-designing activities</i>	<b>6</b>	<b>5</b>	-	<b>4</b>
<b>PC12.</b> submit the design to supervisor / design team for review and feedback	2	1	-	1
<b>PC13.</b> rework or modify the design on the 2D drawings as per the feedback received	2	2	-	2
<b>PC14.</b> tag and store the drawings with the right numbers and codes properly as per the organisational guidelines	2	2	-	1
<b>NOS Total</b>	<b>30</b>	<b>50</b>	-	<b>20</b>

**National Occupational Standards (NOS) Parameters**

<b>NOS Code</b>	ASC/N8114
<b>NOS Name</b>	Computer Aided Product Design
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Research & Development
<b>Occupation</b>	Automotive Product Designing
<b>NSQF Level</b>	5.5
<b>Credits</b>	2
<b>Minimum Educational Qualification &amp; Experience</b>	<p>Completed 3 year UG degree OR Pursuing 3rd year of UG OR Completed 2nd year of UG (UG Diploma) OR 12th grade with 1 year NAC plus CITS with 1 Year of experience In Relevant Trade OR 12th grade pass with 1 year NTC plus 1year NAC/CITS with 2 Years of experience In Relevant Trade OR Completed 3 year diploma after 10th with 2 Years of experience In Relevant Trade OR 12th grade Pass with 3 Years of experience In Relevant Trade</p>
<b>Version</b>	1.0
<b>Next Review Date</b>	NA
<b>CCN Category</b>	1