10

Technology and Livelihood Education

Quarter 1 - Module 1
Operate CAD Software and Computer Hardware
(Identifying CAD software features)

Technical Drafting NC II

ALTERNATIVE DELIVERY MODE

10

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DepED
DEPARTMENT OF EDUCATION

ICT-Technical Drafting – Grade 10
Alternative Delivery Mode
Quarter 1 – Module 1: Operate CAD Software and Computer Hardware
(Identifying CAD software features)

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLMS is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and test. And read the instructions carefully before performing each task.

If you have questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learner.

For the facilitator:

Hi, as a facilitator you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Kindly, advise the learner's parents or guardians of the same procedure since they will be the primary supporters in the learners' progress. Please, do not forget to remind the learner to use separate sheets in answering all of the activities found in the learning module

For the learner:

Hello learner, Welcome to the Technical Drafting NC II Alternative Delivery Mode (ADM) Module on identifying CAD software features. I hope you are ready to progress in your Grade 10 TLE in Technical Drafting NC II with this learning module. This is designed to provide you with interactive tasks to further develop the desired learning competencies prescribed in our curriculum. With this, you are expected to appreciate staking through the information and activity given.

This module has the following parts and corresponding icons:

ICON	LABEL	DETAIL
	What I Need to Know	This contains the learning objectives which you need to accomplish.
	What I know	This evaluates what you know about the lesson you are to learn.
	What's In	This connects the current lesson with a topic necessary in your understanding.
	What's New	This introduces the lesson through an activity.
	What Is It	This contains a brief discussion of the learning module lesson.
	What's More	These are activities to check your understanding of the lesson.
	What I have Learned	This summarizes the important ideas presented in the lesson.
	What I Can Do	This is a real-life application of what you have learned.
	Assessment	This is a post assessment of what you have learned.
	Additional Activity	This is an activity that will strengthen your knowledge about the lesson.

At the end of this module you will also find:

References — This is a list of all sources used in developing this module.

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Identifying CAD software features

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!

What I Need to Know

This module was designed and written to guide you to acquire the learning competencies and develop your skills in operating CAD software and hardware in ICT-Technical Drafting. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. However, the order in which you read the module can be changed to correspond with the textbook you are now using.

Quarter/Week	Q1/W1
Learning Competency Code	TLE_ICTTD9-12CA-Ia-b-1
Learning Competency	**LO 1. Operate CAD software and computer hardware** 1.1 Identify CAD software features according to the software provider

Learning Objectives:

After going through this module, you are expected to:

1. identify the different CAD software according to software provider;
2. design a CAD logo that shows innovation; and,
3. develop traits such as ingenuity, resourcefulness, creativity, independence and passion towards learning.

What I Know

Pretest

Multiple Choice.

Directions: Choose the letter of the best answer. Write the chosen letter on the answer sheet provided.

1. What type of CAD software is often used for drawing, sketching, and drafting conceptual designs?
   A. 2D CAD
   B. 3D CAD
   C. Solid Modelling
   D. 3D Wireframe and Surface Modelling
2. It is a type of CAD software that is used in 3D animation for games and otherpresentations.
   A. 2D CAD
   B. 3D CAD
   C. Solid Editing
   D. 3D Wireframe and Surface Modelling
3. Which of the following type of CAD software lets the designers create objects with length, width, and height, allowing more accurate scaling and visualization?
   A. 2D CAD
   B. 3D CAD
   C. Solid Editing
   D. 3D Wireframe and Surface Modelling
4. Which of the following is NOT a CAD Software?
   A. AutoCAD C. SketchUp
   B. Catia D. Ubuntu
5. It is a CAD software developed and marketed by Autodesk Inc.
   A. AutoCAD C. Autodesk
   B. ArchiCAD D. Alibre Design
6. It is a free 3D CAD software modeled by Google.
   A. Draft sight C. Rhino
   B. Kompass 3D D. SketchUp
7. What is the 3D CAD software that helps in animation, modelling, simulation, and rendering?
   A. Rhino C. Key Creator
   B. Bentley D. Autodesk Maya
8. If you are to draft a jewelry design, what is the appropriate

software that you should use in jewelry design?

A. Rhino
B. Iron CD
C. Solid Works
D. Autodesk Revit

9. What CAD software is used in the Aerospace, Automotive, Machine Industry and Maritime Equipment Design niches?

A. AutoCAD
B. Catia
C. Bentley
D. SketchUp

10. What is the acronym of CAD?

A. Computer Aided Drawing
B. Computer Aided Drafting
C. Computer Aided Design
D. Computer Assisted Design

11. ArchiCAD is created by_____.

A. Autodesk
B. Apple
C. Graphic Soft
D. Microsoft

12. Autodesk 3ds Max is primarily used in what?

A. Film industry
B. Fashion industry
C. Architectural firm
D. Automotive industry

13. Which of the following CAD software is a good alternative to AutoCAD?

A. Maya
B. Draft sight
C. SketchUp
D. Autodesk 3DS Max

14. Who created Autodesk Maya?

A. Autodesk
B. Graphic Soft
C. Microsoft
D. Wix

15. Which of the following statement is False about Computed Aided Design (CAD) software?

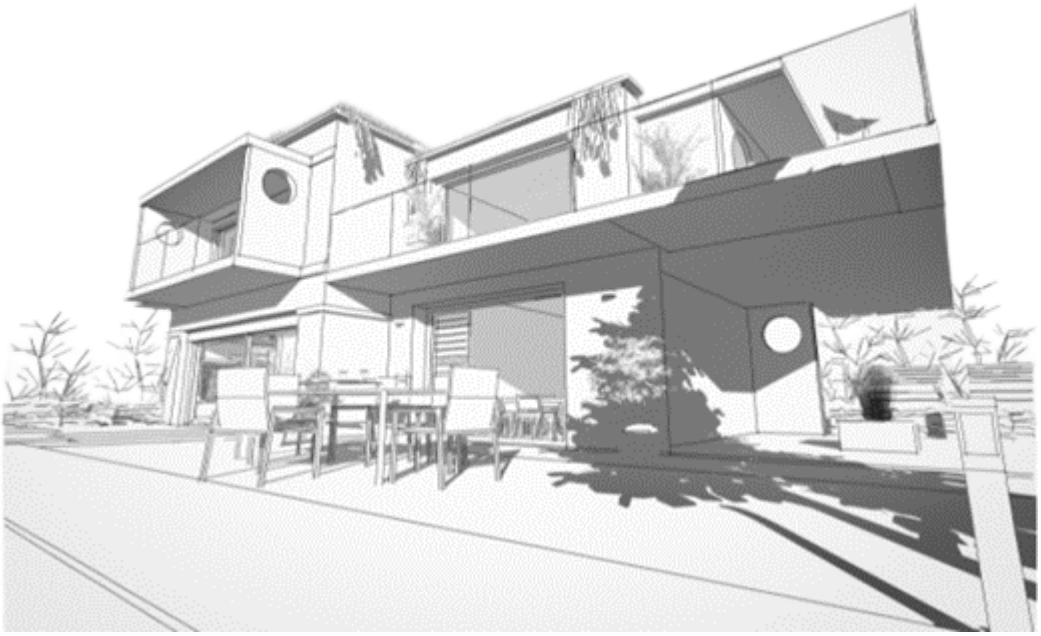
A. CAD is use for 2D dimensional and animation only.
B. CAD software is used to increase the productivity.
C. CAD is an important industrial art extensively used in many applications.
D. CAD is the use of computer systems to assist in the creation, modification, and analysis of a design.

What's In

Look at the illustration below.

- What application software you are familiar with to draft the illustration below?
- Would you rather use the manual drawing or use the CAD Software? Why?

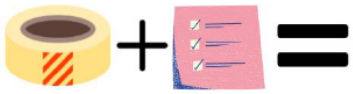
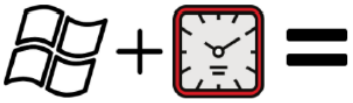
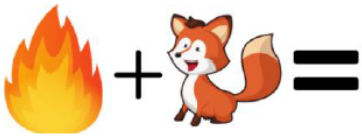
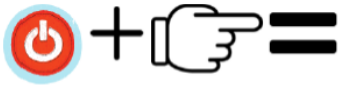
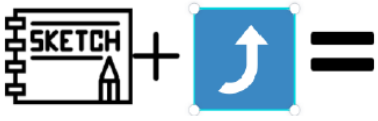
Computer Aided Design (CAD) used by engineers, architects, and construction managers; CAD has replaced manual drafting. It helps users creating designs in either 2D or 3D so that they can visualize the construction. In this module, you will learn different software used by the designers, draftsman, architect, engineers in designing a layout.



What's New

Picture Equation

Directions. Solve the picture equation below. Write your answer in a separate sheet of paper.

1. 	6. 
2. 	7. 
3. 	8. 
4. 	9. 
5. 	10. 

What Is It

What is Computer Aided Design?

Computer-aided design (CAD), also known as computer-aided drafting and design (CADD), is the use of computer systems to assist in the creation, modification, and analysis of a design. It describes the process of creating technical drawings with the use of computer software. CAD software is used to increase the productivity, to improve the quality of design, and to create a database for manufacturing.

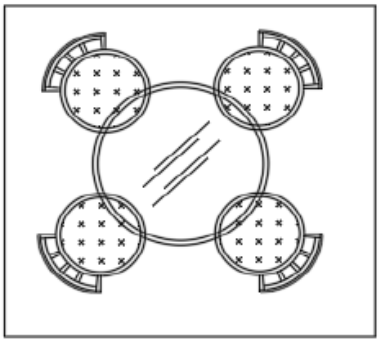
Computer-aided design (CAD) may be used to design curves and figures in two-dimensional (2D) space; or curves, surfaces, and solids in three-dimensional (3D) space. CAD is an important industrial art extensively used in many applications, including automotive, shipbuilding, and aerospace industries; industrial and architectural design; prosthetics; and many more. CAD is also widely used to produce computer animation for special effects in movies, advertising, and technical manuals.

Types of CAD Software

Since its introduction in late 1960's, CAD software has improved by leaps and bounds. A broad classification of CAD is:

1. 2D CAD

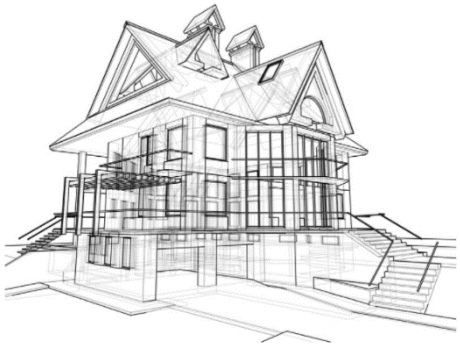
-2D CAD software offers a platform to design in two dimensions. Since 2D CAD does not allow for the creation of perspectives or scale, it is often used for drawing, sketching, and drafting conceptual designs. 2D CAD is used for floor plan development, building permit drawing, and building inspection planning.



Example of 2D drawing

2. 3D CAD

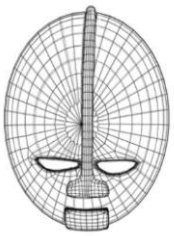
-3D CAD provides a platform for designing 3D objects. The main feature of this type of CAD software is 3D solid modeling. This lets designers create objects with length, width, and height, allowing more accurate scaling and visualization.



Example of 3D drawing

3. 3D Wireframe and Surface Modelling

-Surface modeling is widely used in CAD (computer-aided design) for illustrations and architectural renderings. It is also used in 3D animation for games and other presentations.



A 3D mask wireframe

4. Solid Modelling

- is the most complicated of the CAD technologies, because it simulates an object internally and externally. Solid models can be sectioned (cut open) to reveal their internal features, and they can be stress tested as if they were physical entities in the real world.

A solid modeling example in AutoCAD

5. Single-file-mode systems - This type of CAD software allows only a single user to work on a single file at a time.

6. Referenced-file-mode systems - In this type of CAD software, users can work on their own files with the files of other users attached as a background. This enables users to leverage other users' work as background data.

7. Collaborative-mode systems - These CAD systems take the referenced-mode system to the next level. They allow a team of users to collaboratively work with each other's data and see the changes other users make to the data as they go. And of course, the giants in this field (for example AutoCAD) can be used in different modes of operation.

Below is the example of different types of CAD software.

CAD Software	**Descriptions**
ArchiCAD	• created by the company Graphic Soft. • focuses on creating designs for Architecture. • developed specifically to address architect's desire for greatdesign without compromising on practicality
AutoCAD	• used for 2-D and 3-D design and drafting. • AutoCAD is developed and marketed by Autodesk Inc. and was one of the first CAD programs that could be executed on personal computers. • A wide variety of commands are available for creating complex drawings with lines, polylines, circles, splines, fillets, cross-hatching, text, dimensions, etc.
Autodesk Maya	• A 3D animation software that helps in animation, modelling,simulation, and rendering. • Created by Autodesk • One of the leading software in 3D animation allowing artists tocreate high-quality 3D charterers and scenes.
Autodesk 3DS Max	• A 3D software for animation, modeling, simulation, andrendering. • Primarily used in the film industry.
Alibre Design	• A 3D digital mechanical design and fabrication solution that allow to model custom part that can be 3D printed afterward.

Autodesk Alias	• An industrial design software for surface modeling. • It provides sketching, modeling, surfacing, and visualizationtools for industrial, product, and automotive design.
Auto Desk Revit	• A building and construction software. • Allows users (Architect) to build and visualize architectural designs, MEP, and structural designs, and use thus is mainlyused the construction industry. • Specializes in BIM (Building Information Modeling)
Bentley MicroStation	• Created for the architecture, engineering, construction, and operation of utility systems, roads and rail, bridges, buildings,

What's More

PERFECT PARTNERS

Directions: Match the descriptor from the Column A with the terminologies in the Column B. Write only the letter on your answer sheet.

	COLUMN A		**COLUMN B**
____1	This software is focused on creating designs for Architecture.	A	Light Wave
____2	A famous CAD software by Dassault Systems known to be one of the best for 3DCAD modeling and CAE (computer-aided engineering).	B	AutoCAD
____3	A 3D modeling CAD software that combines a powerful-intuitive modeling and animation tools. This is one of the most used CAD software in the 3D animation industry.	C	SketchUp
____4	A 3D digital mechanical design and fabrication solution that allow to model custom part that can be 3D printed afterward.	D	Draftsight

____5	A CAD software good for managing project ofthousands of sub-assemblies, parts, and standard library products.	E	Kompas 3D
____6	It is a CAD software that specialized in BIM(Building Information Modeling)	F	Autodesk Maya
____7	This CAD software by Autodesk is one of the leading software in 3D animation allowing artists to create high-quality 3D charterers andscenes.	G	Solid Works
____8	A computer-aided design (CAD) program usedfor 2-D and 3-D design and drafting	H	Auto Desk Revit
____9	A free 3D CAD modeler by Google.	I	ArchiCAD
____10	This free CAD software is a good free alternative to AutoCAD and can read DWG file	J	Alibre Design

What I Have Learned

Blockbuster

Directions. Identify the concept being described in each number. Write your answer on a separate sheet of paper.

1. What **C** allows a team of users to collaboratively work with each other's data and see the changes other users make to the data as they go?
2. What **R** allows users work on their own files with the files of other users attached as a background?
3. What **S** allows only a single user to work on a single file at a time?
4. What **C** is also known as computer-aided drafting?
5. What **A** is developed and marketed by Autodesk Inc. and was one of the first CAD programs that could be executed on personal computers?

What I Can Do

MY CAD LOGO

Directions. Create a logo for any of the discussed CAD software. You are not allowed to use, copy, edit any of the existing CAD software logos in your own logo design. Place your logo in a separate sheet of paper.

Your output will be rated using the performance rubric below.

Criteria	Excellent (10)	Good (8)	Satisfactory (6)	Poor (4)
Logo	The logo clearly expresses the CADsoftware using symbols and manipulation of theletters.	The logo adequately expresses the CAD software using symbols and manipulation of the letters	The logo expresses the CAD software using symbols and manipulation of the letters.	The logo does not express the product or services using symbols and manipulation ofthe letters.
Craftman ship	The artwork shows excellent craftsmanship, andattention to detail.	The artwork shows average craftsmanship and attention to detail.	The artwork shows below average craftsmanship and little attention to detail.	The artwork shows poor craftsmanshi pand no attention todetail.
Creativity / Originalit y	The logo clearly demonstrates personal expression. Logo isvery inventive.	The logo demonstrates an average amount of personal expression. Demonstrates Some inventiveness.	The logo demonstrates little personal expression and inventiveness.	The logo lacks evidence of personal expression and inventiveness.
Design	The logo demonstrates excellent use of color. The design easy to understand and is visually compelling.	The logo demonstrates good use of color. The design relatively easy to understand and is somewhat visually compelling.	The logo demonstrates poor choice of color. The design is difficult to understand and is confusing.	The logo lacks thoughtful design.
Use of time	The student put forth the effort required and submitted the output before the deadline	The student put forth effort and submitted the output on time	The student put forth little effort; submitted the output after thedeadline	The student put forth no effort or the project was not completed;did not submit any output
TOTAL				

Post-Assessment

Multiple Choice.

Directions: Choose the letter of the best answer. Write the chosen letter in an answersheet.

_____1. It is a CAD software developed and marketed by Autodesk Inc.
A. AutoCAD C. Autodesk
B. ARCHICAD D. Alibre Design

_____2. Which of the following is NOT a CAD Software?
A. AutoCAD C. SketchUp
B. Catia D. Ubuntu

_____3. Which of the following CAD software is a good alternative to AutoCAD?
A. Maya C. Sketch Up
B. Draft sight D. Autodesk 3DS Max

_____4. Autodesk 3ds Max is primarily used in what?
A. Film industry
B. Fashion industry
C. Architectural firm
D. Automotive industry

_____5. What is the 3D CAD software that helps in animation, modelling, simulation, and rendering?
A. Rhino C. Key Creator
B. Bentley D. Autodesk Maya

_____6. It is a type of CAD software used in 3D animation for games and otherpresentations.
A. 2D CAD C. Solid Editing
B. 3D CAD D. 3D Wireframe and Surface Modelling

_____7. If you are to draft a jewelry design, what is the appropriate software that you should use in jewelry design?
A. Rhino C. Solid Works
B. Iron CD D. Autodesk Revit

_____8. It is a free 3D CAD software modeled by Google.
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B. Kompass 3D D. SketchUp

_____9. What is the type of CAD software that is often used for drawing, sketching, and draftingconceptual designs?

A. 2D CAD
B. 3D CAD
C. Solid Modelling
D. 3D Wireframe and Surface Modelling

_____10. Which of the following statement is False about Computed Aided Design (CAD)software?

A. CAD is used for 2D dimensional and animation only.
B. CAD software is used to increase the productivity.
C. CAD is an important industrial art extensively used in many applications.
D. CAD is the use of computer systems to assist in the creation, modification,and analysis of a design.

_____11. What CAD software is used in the Aerospace, Automotive, Machine Industry andMaritime Equipment Design niches?

A. AutoCAD
B. Catia
C. Bentley
D. SketchUp

_____12. Which of the following type of CAD software that lets the designers create objectswith length, width, and height, allowing more accurate scaling and visualization?

A. 2D CAD
B. 3D CAD
C. Solid Editing
D. 3D Wireframe and Surface Modelling

_____13. Who created Autodesk Maya?

A. Autodesk
B. Graphic Soft
C. Microsoft
D. Wix

_____14. What is the acronym of CAD?

A. Computer Aided Drawing
B. Computer Aided Drafting
C. Computer Aided Design
D. Computer Assisted Design

_____15. ArchiCAD is created by___.

A. Autodesk
B. Apple
C. Graphic Soft
D. Microsoft

Additional Activity

Fill-in the Gaps

Directions. Complete the following descriptions of Computer Aided Design. Write your answer on a separate sheet of paper.

Computer-aided design (CAD) may be used to design (1) and figures in (2) (2D) space and solids in (3) (3D) space. CAD is an important (4) art extensively used in many applications, including (5) , (6) , and (7) industries; (8) and (9) design; prosthetics; and many more. CAD is also widely used to produce computer (10) for special effects in movies, advertising, and technical manuals.

Answer Key

What I Know

1. C
2. D
3. C
4. D
5. A
6. D
7. D
8. A
9. B
10. C
11. C
12. A
13. B
14. A
15. A

What's New

1. Sticky note
2. Google Drive
3. Photoshop
4. Drop Box
5. Counter strike
6. Open Office
7. Windows 10
8. Firefox
9. Lotus 123
10. Sketch Up

What's More

1. I
2. G
3. A
4. J
5. E
6. H
7. F
8. B
9. C
10. D

Assessment

1. A
2. D
3. B
4. A
5. D
6. D
7. A
8. D
9. C
10. A
11. B
12. C
13. A
14. C
15. C

What I Can Do

Performance output
will be evaluated
through given
rubrics

What I Have Learned

C- collaborative mode system
R -referenced file mode system
S- single file mode system
C-computer Aided Design
A-AutoCAD

Additional Activity

1. curves
2. two dimensional
3. three dimensional
4. industrial
5. automotive
6. shipbuilding
7. aerospace
8. industrial
9. architectural
10. animation

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