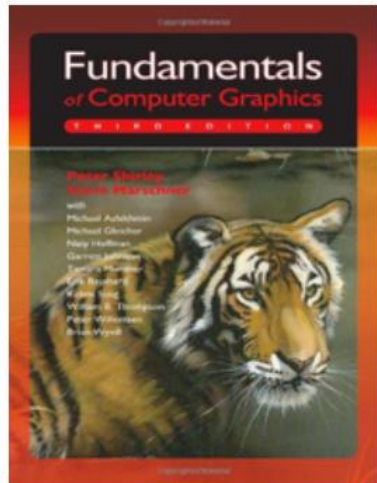




Al-Mustaqbal University  
Department (Department of Prosthetics & Orthotics Engineering)  
Class (third)  
Subject (**Computer Application**)  
Lecturer (Asst.Lec.Ghadeer Haider Abbas)  
1<sup>st</sup> term – Lect. 1 (Introduction)

# Computer Application



*Fundamentals of Computer Graphics*  
Shirley and Marschner, edition  $\geq 3$ .



## Introduction:

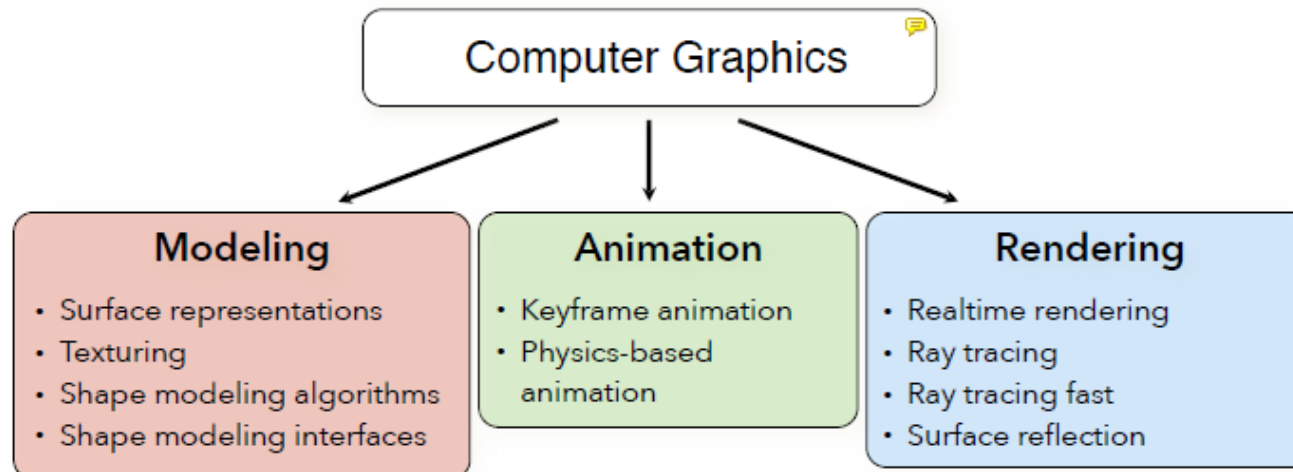
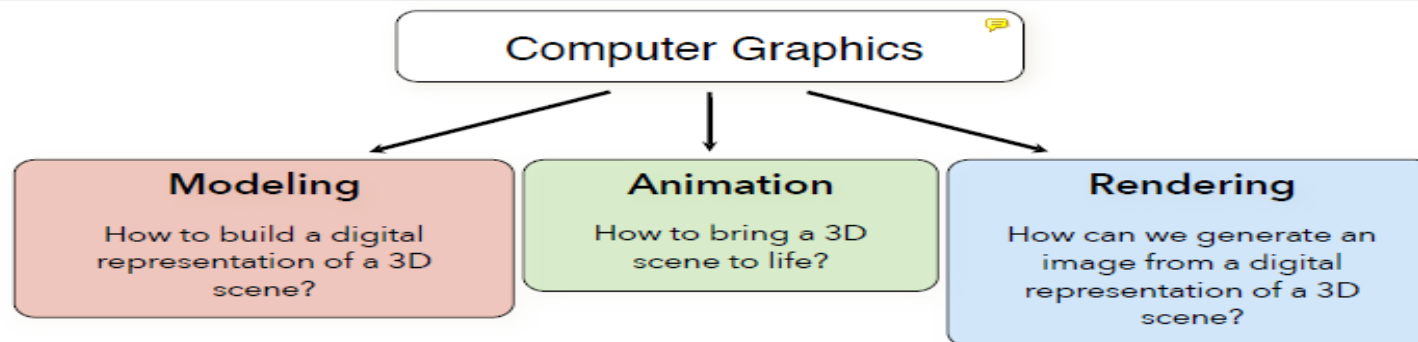
The computer is considered one of the greatest inventions of the modern era, as it has transformed human life and the way people work, learn, and communicate. With the rapid development of technology, computer applications have emerged as essential tools in a wide variety of fields such as education, medicine, engineering, business, media, and even entertainment. These applications have made access to information easier, improved productivity, and enhanced the quality of daily life. With the continuous growth of artificial intelligence, databases, and communication technologies, computer applications have become a fundamental pillar for shaping the future.



## Learning Objectives of the Computer Applications Course

By the end of this course, students will be able to:

1. Understand the basic concepts of computer systems, software, and hardware.
2. Develop proficiency in using common computer applications such as word processing, spreadsheets, and presentation software.
3. Apply computer tools for data organization, analysis, and problem-solving in academic and professional contexts.
4. Gain skills in effective internet use, including online research, communication, and digital collaboration.
5. Recognize the role of computer applications in different fields such as education, business, and engineering.
6. Demonstrate awareness of digital ethics, security, and responsible use of information technology.





## Computer Applications for Engineering Output

### 1. Computer-Aided Design (CAD) Software

Used for creating 2D drawings and 3D models.

Examples: AutoCAD, MicroStation.

### 2. Building Information Modeling (BIM) Applications

Focused on architectural design and construction documentation.

Examples: Revit, ArchiCAD.

### 3. 3D Modeling and Visualization Software

For rendering, visualization, and realistic presentations of engineering projects.

Examples: 3ds Max, SketchUp, Rhino.

### 4. Structural Analysis and Simulation Tools

Used to test the strength, stability, and performance of designs.



Examples: SAP2000, ETABS, ANSYS.

2. Mechanical and Product Design Applications

Focused on designing mechanical parts and assemblies.

Examples: SolidWorks, CATIA, Fusion 360.

3. Rendering and Animation Applications

For high-quality output, animations, and walkthroughs.

Examples: Lumion, V-Ray, Blender.



## 2D Graphics (Two-Dimensional Graphics)

- Represent images using only width and height.
- They are flat and do not show depth.
- Common examples: architectural plans, sections, photographs, logos.
- Software examples: AutoCAD (2D mode), Photoshop, Illustrator.

## 3D Graphics (Three-Dimensional Graphics)

- Represent objects with width, height, and depth.
- They create the illusion of volume and realism.
- Common examples: architectural models, animated movie characters, video game environments.
- Software examples: 3ds Max, Revit, Blender, SolidWorks.

## Key Difference

- ✓ 2D graphics are flat and best for technical drawings and illustrations.
- ✓ 3D graphics create realistic models that can be viewed from different angles.



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# What is computer graphics?





## **Traditional answer: making pictures for people to look at**

- creating (pictures of) virtual objects, virtual worlds
- allowing the depiction of what doesn't exist
- encompasses traditional areas: modeling, animation, rendering, imaging

## **Today it is broader**

- { sound, fabrication, computational design, HCI, ... }
- what it looks like → what it is like
- showing the thing → making the thing
- goal: creative control