SNS COLLEGE OF TECHNOLOGY
(AN AUTONOMOUS INSTITUTION)

Department of Mechanical Engineering

CAD/CAM and Automation

Unit – I

Introduction :
CAD/CAM/CIM

Prepared by

P.Janagarathinam,

Assistant Professor / Mechanical Engineering

SNS College of Technology, Coimbatore

Learning Objectives

- Design, Disciplines
- Definition of CAD
- Definition of CAM
- Definition of CIM
- Need of CAD/CAM/CIM
- Scope of CAD/CAM/CIM

Figure resource : https://tinyurl.com/yab5ggoe

Design

- **What is Design ?**

Figure resource : https://tinyurl.com/yab5ggoe

- Design is the human power to conceive, plan, and realize products that serve human beings, in the accomplishment of any individual or collective purpose.

Design Disciplines

- Applied Arts/Fine Arts:-
  - For aesthetics to objects of function and everyday use
  - For decorative purpose like Paintings, Portraits, etc

Figure resource : https://tinyurl.com/yab5ggoe

Design Disciplines

- Architecture:-
    - Usually of buildings and other physical structures
    - For aesthetics of objects

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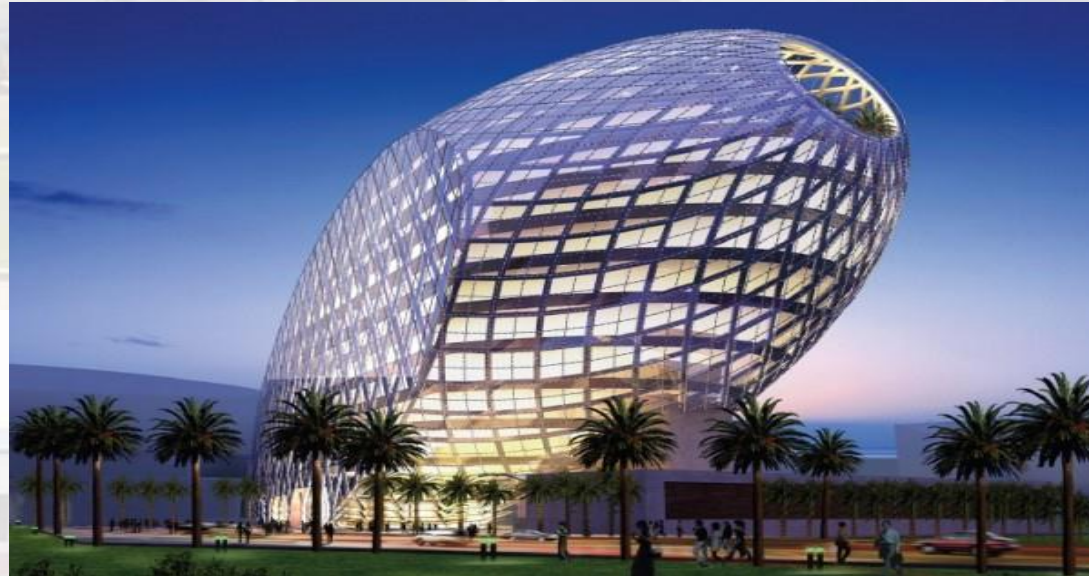
Design Disciplines

- Fashion:-
    - For aesthetics or natural beauty to clothing and accessories
    - Influenced by cultural and social latitudes
    - For Garments, Texture, etc.

Figure resource : https://tinyurl.com/yab5ggoe

Design Disciplines

- Gaming Industry:-
    - For content and rules of a game
    - Gameplay, environment, storyline and characters

Design Disciplines

- Engg. Design:-
  - Preliminary design
    - Schematics, diagrams, layouts of the project
  - Detailed design
    - Operating parameters, Test, Materials, Packaging
  - Production planning and tool design
    - Jigs, fixtures, and tooling
  - Production

Design Disciplines

- Mechanical Design
  - For Machines like Lathe, Drill
  - For Turbo-machines like Turbine, Propeller
  - For Automobile like Chassis, Transmission
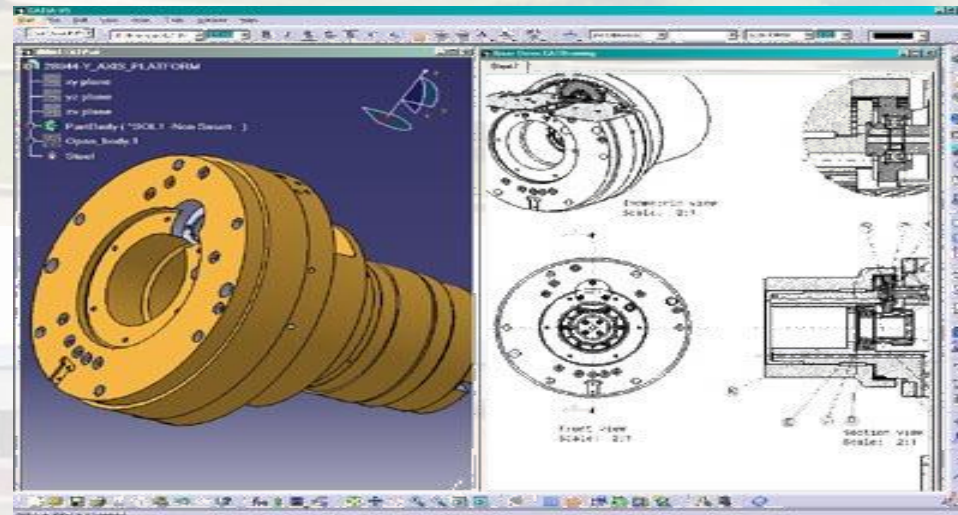 - For Components like Gears, Shafts, Joints, etc.

Figure resource : https://tinyurl.com/yab5ggoe

Computer Aided Design

- Use of computer systems to assist in creation, modification, analysis and optimization of a design

- Computer assistance, while a designer converts his or her ideas and knowledge, into a mathematical and graphical model represented in a computer
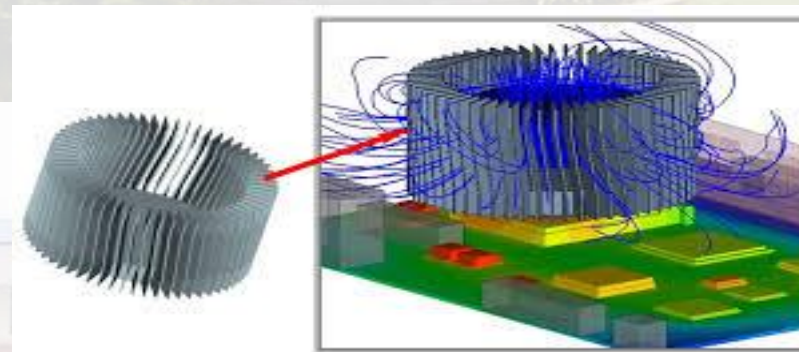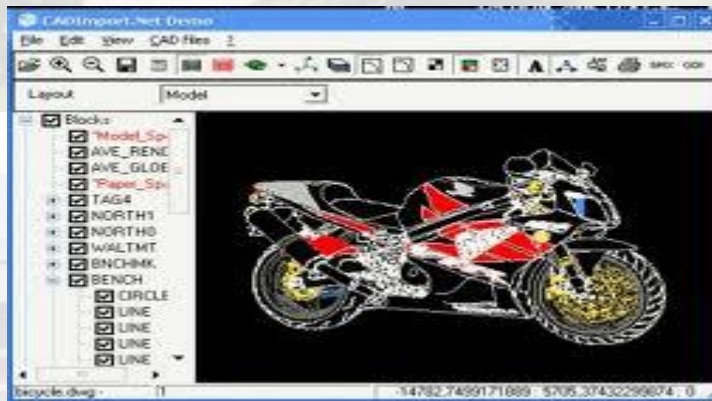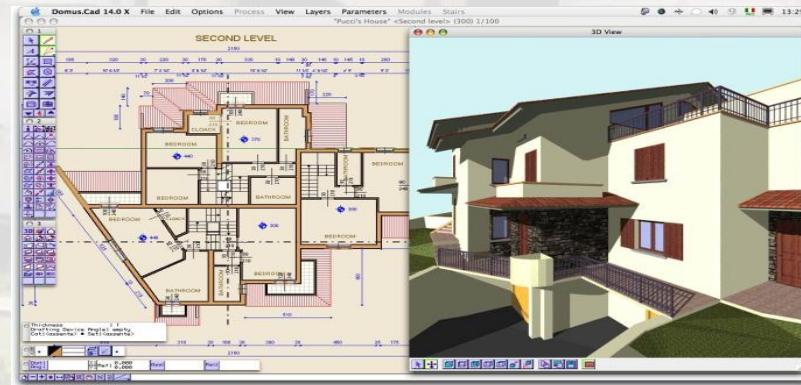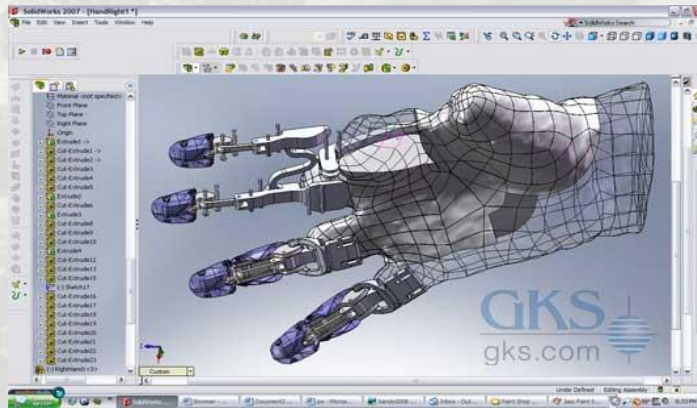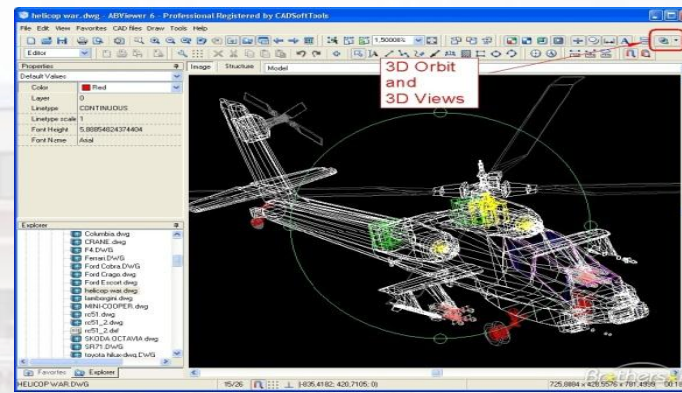
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Manufacturing

- What is Manufacturing?

Process of production of objects from metals or non-metals, with or without application of force, with or without application of heat, with or without use of machines, joining or removing of excess material.

Manufacturing Processes

- Chemical Process

- Mechanical Process as Bending

- NC/CNC Process as Turning, Facing

- Casting

- Molding

- Forming

- Machining

- Joining

- Rapid manufacturing

Computer Aided Manufacturing

- Use of computers systems to plan, manage and control the operations of a manufacturing plant through either direct or indirect computer interface with plant's production resources

- Manufacturing support applications –Use of computers in process planning, scheduling, shop floor control, work study, tool design, quality control etc
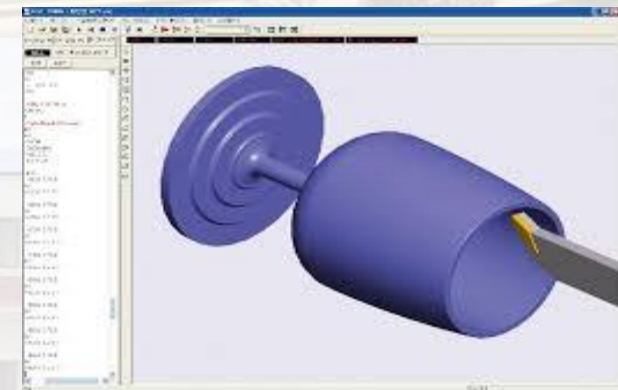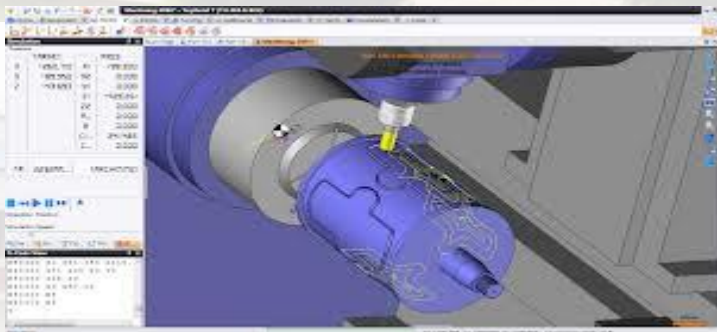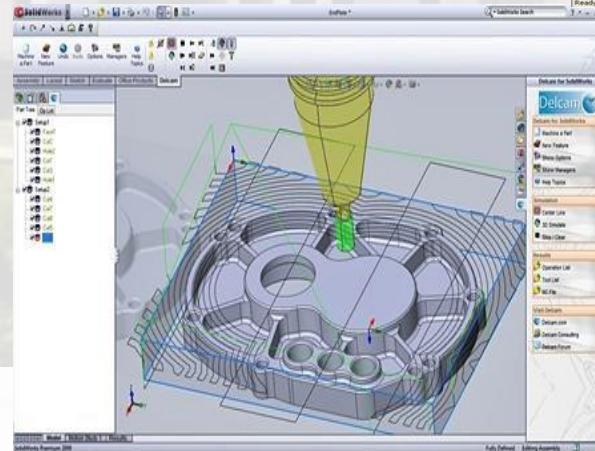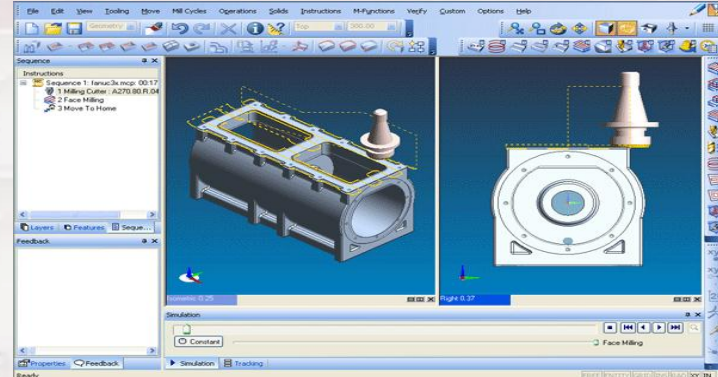
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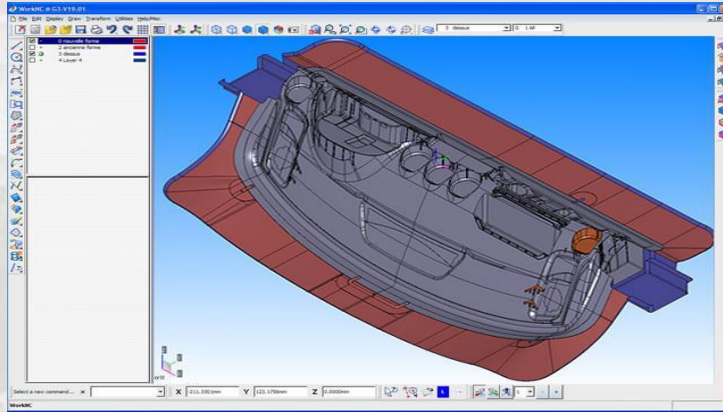
Computer Integrated Manufacturing

- A process of integration of CAD, CAM and business aspects of a factory. It attempts complete automation with all processes functioning under computer control
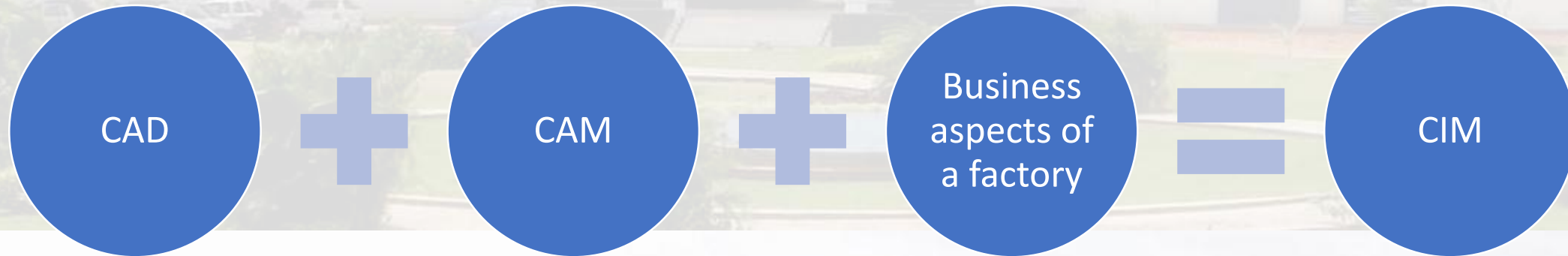
CIM

CAD **+** CAM **+** Business aspects of a factory **=** CIM

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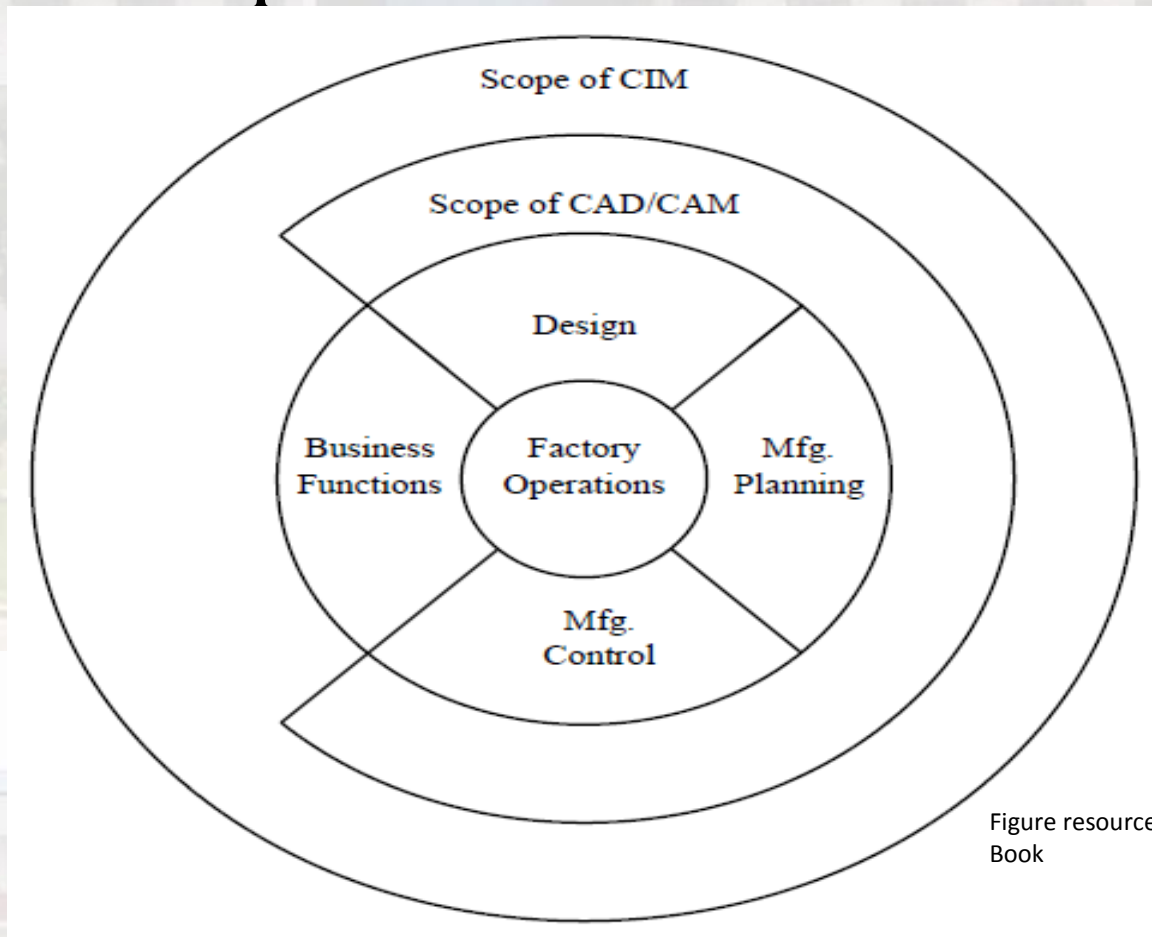
Scope of CAD/CAM/CIM

Figure resource : Introduction to CAD CAM CIM Book

Origins of CAD

- The first source of CAD resulted from attempts to automate the drafting process

- These developments were pioneered by the General Motors Research Laboratories in the early 1960s

- CAD became more widely used after 1970 because of technological advancements

- CAD allowed users to design products much quicker without the production of an actual product

- Beginning in the 1980s Computer-Aided Design   programs reduced the need of draftsmen significantly

- Their affordability and ability to run on personal computers also allowed engineers to do their own drafting work

Uses of CAD

CAD I<small>S</small> U<small>SED</small> T<small>O</small> D<small>ESIGN</small> A V<small>ARIETY</small> O<small>F</small> D<small>IFFERENT</small> P<small>RODUCTS</small> F<small>OR</small> A V<small>ARIETY</small> O<small>F</small> F<small>IELDS</small> S<small>UCH</small>

- A<small>RCHITECTURE</small>
- E<small>LECTRONICS</small>
- A<small>UTOMOTIVE</small> E<small>NGINEERING</small>
- I<small>NDUSTRIAL</small> D<small>ESIGN</small>
- M<small>ACHINERY</small>
- V<small>ISUAL</small> A<small>RT</small>
- M<small>EDICAL</small> D<small>ESIGN</small>

SAQ

1. What is CAD?
2. What are the application of CAD ?
3. What is CAM?
4. What are the application of CAM ?
5. What is meant by the concept of CAD/CAM?
6. What is CIM?
7. What is need of CAD/CAM/CIM ?
8. What is scope of CIM ?

- THANK YOU