



Computer Aided Manufacturing (CAM)

INTRODUCTION TO CAM

Assoc. Prof. Dr. Tamer S. Mahmoud



1. Aim of the course

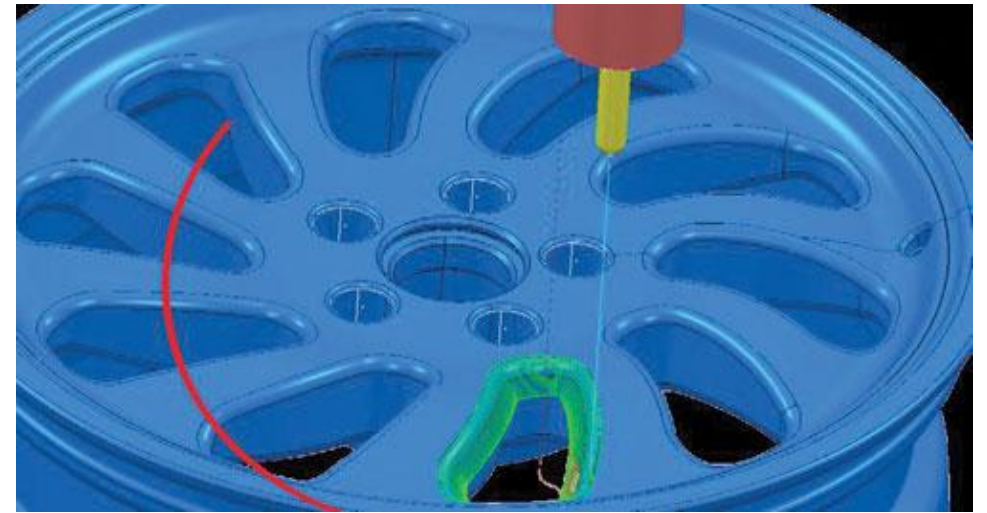
- The aim of this course is to provide students with an understanding of advanced technologies and tools, which play a significant role in manufacturing of engineering components.



2. Objectives and learning outcomes

To achieve this aim, the unit has the following objectives and learning outcomes:

- Develop an understanding of the advanced aspects of enabling computer aided technologies used in manufacturing.
- Apply knowledge on advances in modern techniques of rapid prototyping and rapid tooling



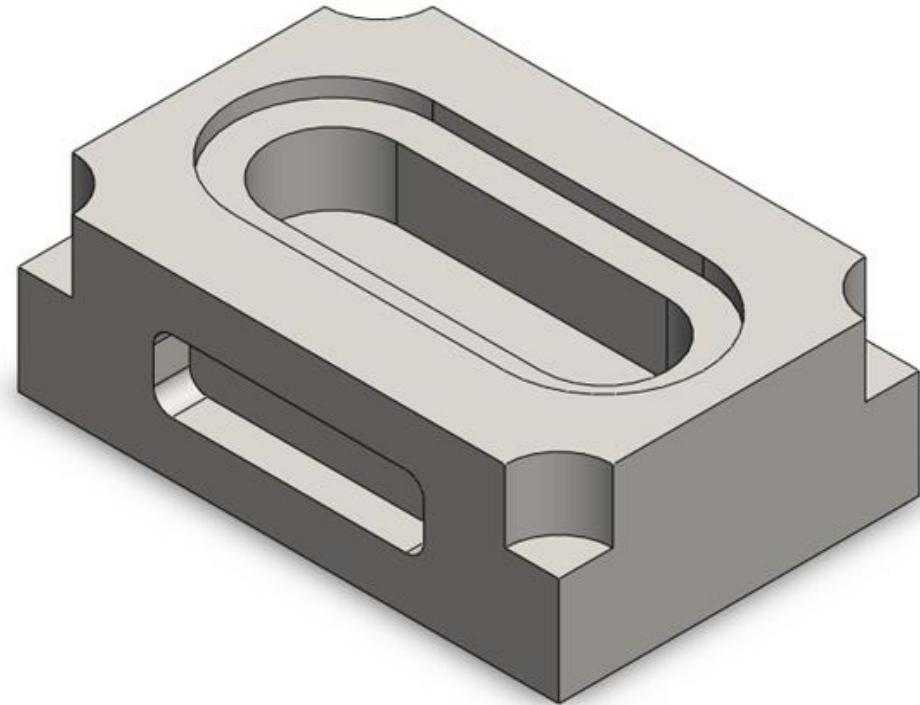
3. Course Contents

1. Introduction to CAM.
2. Introduction to CNC.
3. CNC Hardware & Tooling Basics.
4. Reverse Engineering (RE).
5. Rapid prototyping (RP).
6. Industrial Robots.
7. Group Technology (GT).
8. Cellular Manufacturing.
9. Flexible manufacturing systems (FMS).



4. Course Materials

- PowerPoint Presentations.
- CNC simulator help.
- FeatureCAM help.

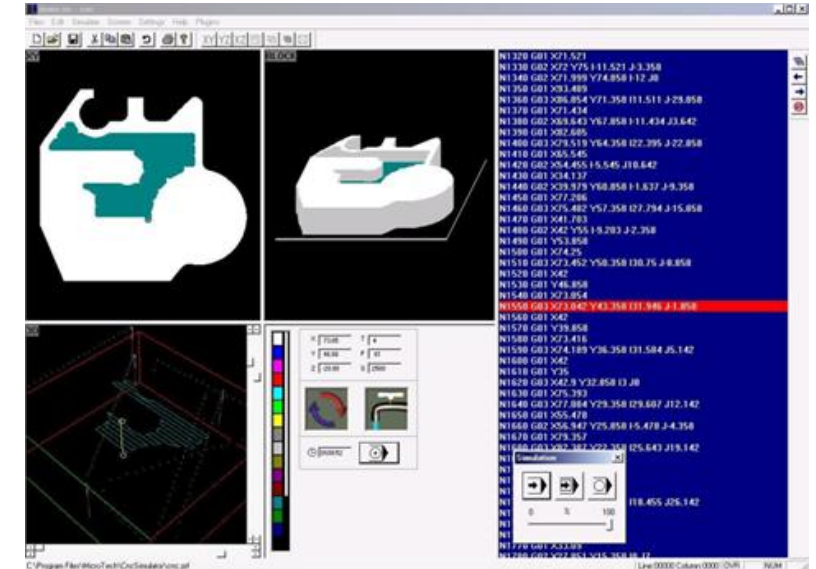


5. References

- P. N. Rao, “CAD/CAM Principles and Applications”, 2nd Edition, McGraw Hill, 2004.
- Chennakesava R. Alavala, “CAD/CAM: Concepts and Applications”, PHI Learning, 2011.
- Farid Amirouche, “Principles of Computer Aided Design & Manufacturing”, 2nd Edition, Pearson Education, 2004.
- Steve Krar and Arthur Gill, “Computer numerical Control Programming Basics”, Industrial Press Edition, 1999.
- James V. Valantino and Joseph Goldenberg “Introduction to computer Numerical Control”, 2nd Edition, Prentice Hall, 2000.

6. Assessment Method

Assessment	Marks
Midterm Exam	15
Practical Exams	15 (Average 2 Exams)
Oral Exam	10
Assignments	10
Final Exam	75
Total	125

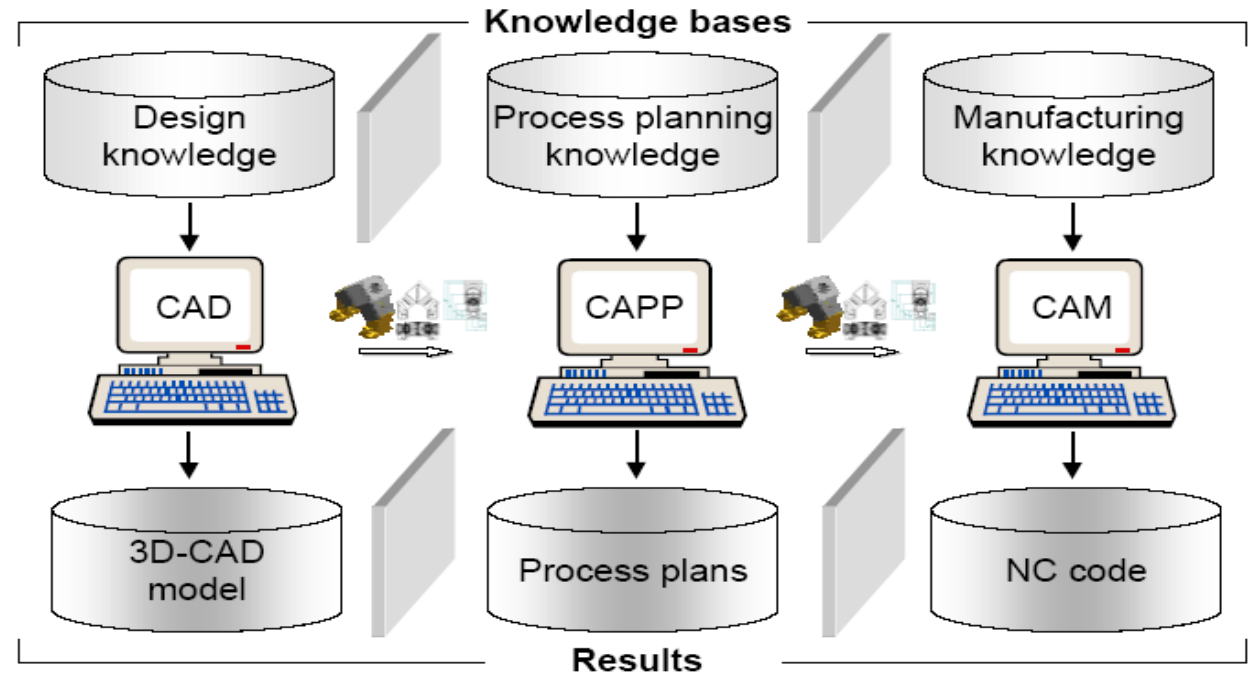


7. Course Plan

Week No.	Lecture Topic	Lab/Tut. Topic
1	Introduction to CAM	Introduction
2	Introduction to CNC	Intro. to CNC Part Programming
3	CNC Hardware & Tooling Basics I	Intro. to CNC Part Programming
4	CNC Hardware & Tooling Basics II	Manual Milling Part Prog.
5	Reverse Engineering (RE)	Manual Milling Part Prog.
6	Rapid prototyping (RP).	Manual Turning Part Prog.
7	Industrial Robots.	Manual Turning Part Prog.
8	Midterm Exam	Practical Exam I
9	Group Technology (GT).	CAMWorks 2.5D Milling
10	Cellular Manufacturing	CAMWorks 2.5D Milling
11	Flexible manufacturing systems (FMS)	CAMWorks 2.5D Milling
12	Computer aided process planning (CAPP) I	CAMWorks 2.5D Turning
13	Computer aided process planning (CAPP) II	CAMWorks 2.5D Turning
14	REVIEW	CAMWorks 2.5D Turning
15	Final Exam	Practical Exam II + Oral Exam

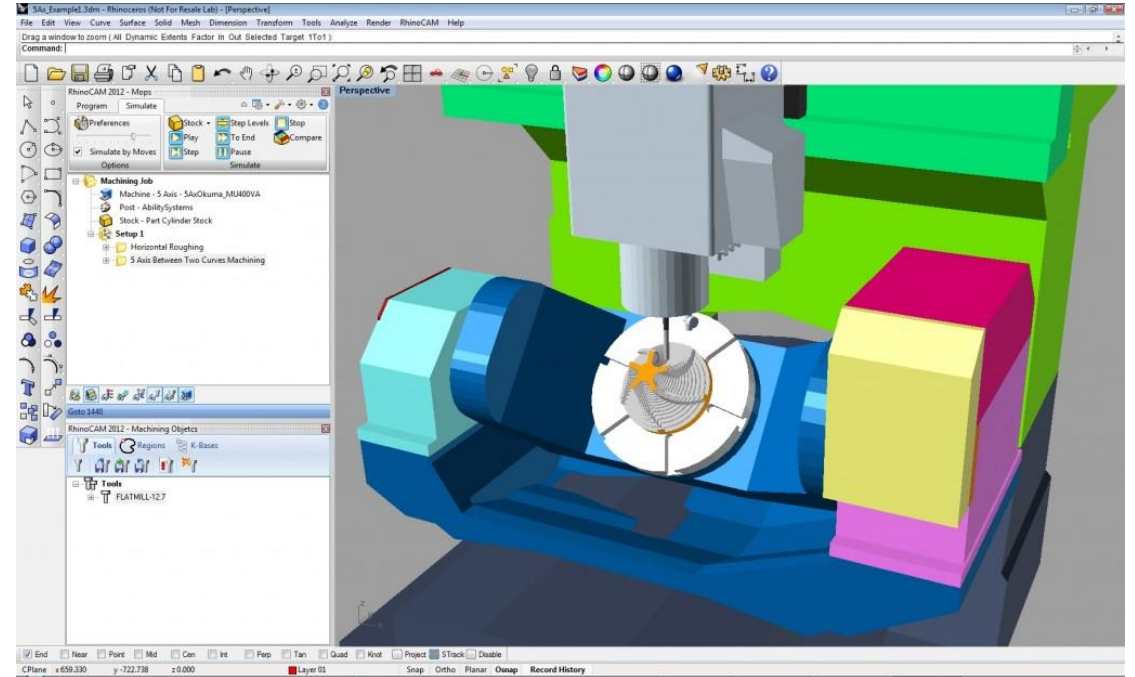
8. What is CAM?

- Computer Aided Manufacturing (CAM) involves the use of computer programs specifically designed to create the geometry and tool paths needed for parts to be machined.
- These tool paths can then be automatically processed into a program specific for the CNC machine to be used.



8. What is CAM?

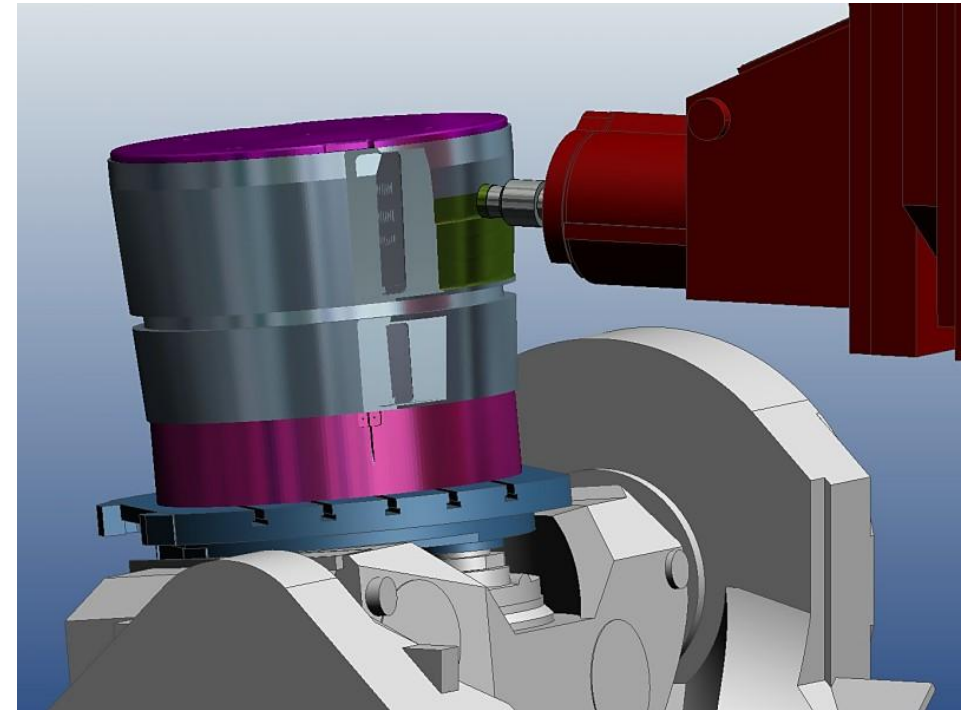
- Very often a CAM process follows directly on from a CAD process, in such cases the complete design and manufacture process is called **CAD/CAM**.
- The main advantage of this approach is that the CAD design can be used to generate the program which will control the manufacturing process.



9. Advantages of CAM

The advantages of CAM systems are:-

- Products can be made very accurately and consistently;
- Around the clock production is much cheaper;
- A product's design can be modified without the need to bring production to a complete standstill;
- Waste can be kept to a minimum.



Thank You

