

# School of Mechanical Engineering

Course Code : MCDM5004

Course Name: Product Design and Life cycle Management

UNIT I

## INTRODUCTION

GALGOTIAS  
UNIVERSITY

Name of the Faculty: Dr MANIRAJ M

Program Name: M.Tech (CAD/CAM)

# INTRODUCTION

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# IMPORTANT DEFINITIONS

❖ **Quality** - Measure of how well a product satisfies a customer at a reasonable price. Dr. Juran, a famous pioneer in quality, defined quality as "fitness for use". Any deviation from the customer's requirements is called the "cost of quality" whether it is caused by design or manufacturing.

❖ **Design quality** - how well the design meets all requirements of the customer and other groups that interact with the product. Design quality can be measured by how well the product's design performs as compared to its product requirements and to the competition.

❖ **Software quality** - when the final product performs all functions in the manner intended under all required conditions. To achieve quality, software must contain a minimum number of mistakes as well as being void of misconceptions. This includes problems in requirements, architecture, domain, design, coding, testing, and installation.

❖ **Manufacturing quality** - measured as the percentage of products that meets all specified design and manufacturing requirements during a specified period of time. This is also expressed as failures, yield or as a percentage of products with defects. Many experts believe that manufacturing quality should be measured as a process's variance or uniformity about some target parameter.

## PRODUCT DEVELOPMENT TEAMS

❖ One product development strategy is to **organize the assets and resources** of a company into integrated Product Development Teams or PDT, with complete responsibility for **designing, producing and delivering** valuable products to customers.

❖ Accountable for delivering quality, performance, program profitability, and additional business.

❖ Every team member is problem solver. The team is made up of combinations of people from different disciplines or functional organizations. Vendors and customers are often included. This approach relies on teams of people with the right skills working together smoothly to meet business objectives. In the future, firms will compete more on the basis of what they know, than on what they do. The skills and knowledge embodied in the work force will become the key competitive asset.

❖ Reasons why a Product Development Team approach is vital

- Product design that is compatible with manufacturing or service capabilities and life cycle requirements.
- Speed up the design process, delivery and service
- Use of new technologies and tools, such as the Internet, enable communication and collaboration between personnel in different organizations, functional areas, disciplines, and locations.

# CONCURRENT ENGINEERING

- ❖ Concurrent Engineering (CE) or Simultaneous Engineering (SE) is a watchword for world-class companies to **speed up and improve their product development process.**
- ❖ A systematic approach to the integrated, concurrent design of products and their related processes, including **manufacture and support.** This approach is intended to cause the developers, from the outset, to consider all elements of the product life cycle from conception through disposal
- ❖ The major objective of concurrent engineering is to **overlap the different phases of design to reduce the time needed to develop a product.** It requires the simultaneous, interactive and inter-disciplinary involvement of design, manufacturing and field support engineers to assure design performance, product support responsiveness, and life cycle reliability products.

- ❖ Product development teams use CE to break down the traditional functional barriers by integrating team members across different business entities within an organization.
- ❖ Development and deployment of an effective CE approach requires:
  - Flexible decision models to represent the process by which a product development team could simultaneously design, debate, negotiate and resolve.
  - Knowledge representation schemes and tools to support and implement the integration requirements imposed by CE .
  - Tools that facilitate simultaneous collaborative communication .
  - Quantitative and qualitative tools that measure the impact of decisions on all product parameters.

# References

1. Karl T. Ulrich and Steven D. Eppinger (2009), Product Design and Development, 4<sup>th</sup> Edition, Tata McGraw-Hill Publishing Company Limited, ISBN: 978-0-070-14679-2
2. Stephen C. Armstrong (2005), Engineering and Product development Management– The Holistic Approach, Cambridge University Press, ISBN: 978-0-521-01774-9.
3. Thomas A. Sabomone, (1995), What every engineer should know about concurrent engineering, Marcel Dekker Publications, ISBN- 978-0-824-79578-8.



A large, faded logo of Galgotias University is centered in the background. It features a stylized 'G' composed of several overlapping, curved segments in shades of yellow, orange, and light blue.

**Thank you**

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