

I YEAR M. TECH (MACHINE DESIGN) SECOND SEMESTER

17MEMD2T6C

CONCURRENT ENGINEERING

Credits 4

Lecture: 4 periods/week

Internal assessment: 40 marks

Tutorial: - -

Semester end examination: 60 marks

COURSE OBJECTIVES:

- Acquire knowledge about entire product life cycle, from design to disposal, in an integrated design process.
- To introduce Concurrent Engineering Principles applied to manufacturing Sectors.
- State various techniques and concepts of achieving manufacturing excellence through Concurrent Engineering.
- Acquire knowledge regarding manufacturing competitiveness, life cycle management, product process, and organization.

COURSE OUTCOMES:

After completion of the course, student should be able to

1. Understand the need for adopting CE methodology to organizations.
2. Understand the importance of such factors as the right corporate culture, multi-disciplinary teams and their empowerment for successful implementation of CE.
3. Undertake an evaluation of the company's present communication infrastructure and recommend suitable changes to support the CE environment.
4. Become familiar with a range of computer based tools for modeling engineering processes and information.
5. Understand various factors and techniques required to optimize the product development process.

UNIT-I

INTEGRATED PRODUCT DEVELOPMENT:

Idealized model for Integrated Product Development, Integration between project and management, Integration with other development activities, understanding the IPD model, Validity of the IPD model. Introduction: Extensive definition of CE-CE design Methodologies - Organizing for CE, CE tool box collaborative product development.

UNIT-II

DESIGN STAGE:

Life-cycle design of products - opportunity for manufacturing enterprises -modality of Concurrent Engineering Design, Automated analysis idealization control - Concurrent engineering in optimal structural design - Real time constraints checking the design process

UNIT-III

CONCEPTUAL DESIGN MECHANISM:

Qualitative physical approach, an intelligent design for manufacturing system Modeling and reasoning for computer based assembly planning.

UNIT-IV

DESIGN FOR ECONOMICS:

Evaluation of design for manufacturing cost, Concurrent mechanical design - decomposition in concurrent design -negotiation in concurrent engineering design studies

Learning Resources

Textbooks:

1. Integrated Product Development by Anderson MM and Hein, L. Berlin, Springer Verlag, 1987
2. Design for Concurrent Engineering by Cleetus, J, Concurrent Engg. Research Centre, Morgantown, WV, 1992

References:

1. Concurrent Engineering: Automation Tools and Technology by Andrew Kusaik, John Wiley and Sons Inc., 1992
2. Concurrent Engineering Fundamentals: Integrated Product Development by Prasad, Prentice Hall, 1996
3. Successful Implementation of Concurrent Product and Process by Sammy G Sinha, John Wiley and Sons Inc, 1999