
Corporate integration technologies

Finalità

The class is concerned with system-level integration in industrial companies, by means of computer-based architectures and Computer Integrated Manufacturing (CIM) tools. The main issues related to Product Data Definition (PDD) and Product Data Management (PDM) are investigated, in collaborative, multidisciplinary integrated environments, as well as the issues related to manufacturing process planning (Computer Aided Process Planning – CAPP systems) in Concurrent Engineering (CE) environments.

The class will alternate theory and practice. Software tools will be adopted to exemplify some of the topics studied.

Programma

Product Data Definition (PDD) and Product Data Management (PDM)

Product design as a multidisciplinary and collaborative activity. Information sharing in distributed collaborative environments. Product information as a hybrid structure including geometry as a subset. Issues in Product Data Definition (PDD); issues and systems for Product Data Management (PDM). Product life-cycle analysis (LCA) and environmental impact analysis.

Process data definition and management – Computer Aided Process Planning (CAPP)

Computer Aided Process Planning (CAPP); issues and techniques for modeling the manufacturing process in process planning architectures. Architectures and resolution strategies for CAPP systems: EDP approach, variational and generative approaches to the planning problem. CAPP systems and Group Technology. Integration issues in CAD/CAPP/CAM software. Assembly process planning, Computer Aided Assembly Process Planning (CAAP) and Computer Aided Disassembly Process Planning (CADP).

Software tools for system-level integration

Software integration architectures for automated industrial production: rigid and flexible automation in manufacturing systems, manufacturing cells, Flexible Manufacturing Systems (FMS).

Information Technology as the means for integrating product design and process planning activities, Computer Integrated Manufacturing (CIM). Information technology as the means for integrating companies: computer-based architectures for network-based collaborative design and supply chain management. Computer Integrated Business (CIB)

Attività d'esercitazione

The laboratory activities include the use of software tools for addressing many of the issues related to PDM, CAPP e CIM introduced in the lectures. A group project and related final report will be generated.

Modalità d'esame

The exam consists in a written and an oral test, which will include also the discussion of the group project.

Propedeuticità

Disegno Industriale, Tecnologia Meccanica, Produzione Assistita dal Calcolatore.

Testi consigliati

C. MCMAHON, J.BROWNE: “CAD/CAM: Principles, Practice, and Manufacturing Management”, Addison-Wesley Pub Co, 2nd edition, 1999.

K. LEE: “Principles of CAD/CAM/CAE Systems”, Addison-Wesley Publishing; 1st edition ,1999.