

Objectives

The objectives of the course are to develop competencies of Masters students in Engineering to carry Product Architect jobs.

Product Architects are Key person beside project manager with strong technical skill and holistic vision of product design flow.

Design and product development tools and methods used in Engineering Design.

The course focus on methods and tools used to ensure quality and performance of Engineering Design processes and product development.

Focus is not on product specific technology even if products studied are manufactured and assembled products.

Syllabus

Introduction to Product design and development process. Stakeholder Requirements and specification-User Product requirements formalization, Functional elicitation and modeling, QFD and Market segmentation. Product architecture - modularity and platform, Architecture definition, Design Structured Matrix (product) and Function allocation. Manufacturing issues - Manufacturing flow, Assembly cost estimation, Design for assembly basics and Supplier management. Design to cost - product cost analysis and value analysis. Product design processes organization and performance- project organization, Lean product development and System Engineering

Course outcomes

At the end of the course student should be able to:

- * Identify, analyze and synthesize all the stakeholders' needs and customer requirements
- * Design the product / system architecture in collaboration with the others métier architects (Hardware, Mechatronics, Software,...) and allocate each functions into different sub-system.
- * Manage the Conformity Matrix in order to ensure a consistent set of requirement dealing if necessary the requirements with the customer taking into account the global vision of product a design to cost approach.
- * Understand and analyze organization of a product development process
- * Ensure the transfer of all data to the Project internal contributor and external supplier in case of award and ensure the interface with the customer.

While the course aims to develop practical skills about engineering tools the student will be asked to develop also theoretical knowledge about current research in product design and research paper reading.

TEXT BOOKS/ REFERENCES:

1. Mital, A. (2008). *Product development : a structured approach to consumer product development, design, and manufacture*. Amsterdam ; Boston, MA: Butterworth-Heinemann, An imprint of Elsevier, cop.
2. Ulrich, K. T., & Eppinger, S. D. (2004). *Product Design and Development* (Vol. Third edit). McGraw-Hill.
3. Whitney, D. E. (2004). *Mechanical Assemblies: Their Design, Manufacture, and Role in Product Development*. Oxford: Oxford University Press.
4. Pahl, G., Beitz, W., Wallace, K., Blessing, L., & Bauert, F. (1996). *Engineering design a systematic approach*, . second edition Springer .
5. Brown, T. (2008). Design Thinking. *Harvard Business Review*, (June).