FREDERICK UNIVERSITY CYPRUS

Subject:	Product Design and Development – MME511
Academic Year:	-
Lecturer:	Dr. Antonios Lontos
Number of periods per week:	3
Number of total weeks:	12
ECTS:	6

MSc in Engineering Management (http://www.frederick.ac.cy/MSCEM/)

Aims:

This course aims to improve the ways in which product design and innovation managements is managed and to generate products and services that exceed the expectations of all stakeholders.

On completion of this course, participants should be able to:

- Develop new approaches to managing design and product development
- Improve the management of products and brands
- Understand and improve the strategic use of design at a firm levels
- Define the components of product design and development processes and their relationships from concept to customer
- Define the design management process and how innovation can be successfully brought to the market place to satisfy customers in an effective manner
- Undertake a methodical approach to the management of product development
- Distinguish the differences between the important methods, technologies, latest trends, tools and techniques of product design and development and how they can be effectively utilized

Outcomes:

By the end of this course students should able to:

- Understand the natural of engineering design and how it is done
- Learn about new methods and development processes during designing and development of products
- To combine the theoretical and practical knowledge in order to plan carefully the designing of a new products

Description:

- Product development process tools. Product development teams. Product development planning
- Understanding customer needs. Organizing and prioritizing customer needs
- Product specifications. Establishing target specification. Setting product specifications
- Concept specification, selection and testing
- Product architecture. Types of modularity. Product change. Establishing the architecture
- Industrial design. The industrial design process. Management of the industrial design. Assessing the quality of industrial design
- Design for manufacturing and assembly. Manufacturing cost analysis. Reduce the cost for assembly. Reduce the cost of supporting production. Design for the environment. Techniques to reduce environmental impact

- Rapid prototyping technologies and techniques. Planning for prototypes.
- Patents and intellectual property
- Industrial Experiences of product development. Innovative Products

Labwork:

- Individual or small group modeling performed with the use of common industrial packages such as Autocad, Solidworks, Cosmos, MDesign. Design and construction of prototypes using advanced Rapid prototyping techniques.
- Project: Use special software to analyze and optimize a real case study. Investigate the influence of all factors described in the case study.
- Readings: The students are expected to read and review several papers from relevant scientific journals.

Textbooks:

1. **Product Design and Development,** Karl Ulrich, Steven Eppinger, McGraw-Hill, 2007
2. **The Mechanical Design Process,** 4th Edition, David G Ullman, Oregon State University, McGraw-Hill 2010
3. **Engineering Design,** 4th Edition, McGraw- Hill, George Dieter, 2009
4. **Engineering Design,** Rudolph J. Eggert, Prentice Hall, 2005

References:

5. Design for Six Sigma, Basem S. El-Haik, McGraw-Hill, 2008
6. Project Management in New Product Development, Bruce T. Barkley, 2007
7. Kevin Otto, Product Design, Techniques in Reverse Engineering and New Product Development, Kristin Wood, 2001
8. Mechanical Design, An Integrated Approach, Ansel C. Ugural, Mcgraw Hill, 2004
9. Mechanical Engineering Design, Ch. R. Mischke, J. Edward, McGraw-Hill, 7th Edition, 2004
10. Fundamentals of Engineering Design, Barry Hyman, 2nd Edition, Prentice Hall, 2003
11. Engineering Design and Problem Solving, Steve K. Howell, 2nd Edition, Prentice Hall, 2002
12. Fundamental of Machines Components Design, Robert C. Juvinall, Kurt M. Marshek, McGraw-Hill, 2000

Assessment:

Final Exam (60%), Projects (30%), Readings (10%)