PRODUCT DESIGN AND DEVELOPMENT

- **Course code**

  8166

- **Type of course (compulsory, optional)**

  Compulsory or optional depending on the specialization

- **Level of course**

  First Cycle

- **Year of study**

  2014-2015

- **Semester**

  8th Semester

- **Number of credits allocated**

  6 ECTS Credits

- **Name of lecturer**

  Soderquist Eric, Associate Professor

- **Learning outcomes**

This course will equip the students with basic understanding and fundamental knowledge about product design, new product development, and the management and strategic importance of these processes. The emphasis is on developing practical skills related to product management from the perspectives of industrial design and product engineering. The course has an interdisciplinary base, which resides on innovation and then integrates concepts and methods of aesthetics, semantics, design functionality, technology management, user-led innovation, manufacturing, environmental sustainability, ergonomics, organization and strategy. The aim is to propose a balanced blend of creative, technical and managerial aspects of the subject matter.

The mix of pedagogical methods -lectures, exercises, cases, visits and group project- will instill an independent learning ability among the students, required to grasp and the complexity of product design and development.

More specifically, the course aims to:

- Provide an integrated understanding of product design and development by combining creative thinking, aesthetic awareness, technological reasoning, customer/market understanding, and strategizing capability;
- Develop design thinking, design management and design execution skills;
- Familiarize the students with methods, tools and software for product design and product development management;
- Instill awareness about the importance of product design for innovation in general, e.g., in terms of human centered design, sustainable & green design and open innovation models;
- Develop technology analysis, manufacturing/industrialization, and market awareness skills related to product design and product development.

- **Mode of delivery (face-to-face, distance learning)**

Face-to-face teaching, case study discussions, exercises, experiments, filed visits, student team project.

- **Prerequisites and co-requisites**

N.A.

- **Recommended optional programme components**

N.A.

- **Course contents**

Unit 1 Introduction and Basic Concepts (Weeks 1-3)

- Course Structure, Content and Objectives
- Design Semantics
- Design Thinking – Aesthetics and Functionality
- Design and Materials – Material Characteristics and their Relation to Design

Unit 2 Product Design (weeks 4-6)

- Methods, Tools and Software
- Designing for Innovation
- Human Centred Design
- Design Research Methods – Technology and Markets
- Testing and Prototyping

Unit 3 Industrialization of New Products (weeks 7-8)

- Design for Manufacturing
- Manufacturing Systems and Supply Chain
- Building an industrialization plan
- New manufacturing possibilities: 3D Printing

Unit 4 Management of Product Design and Product Development (weeks 9-10)

- Process Models for Product Development and Innovation
- Structure and Organization of Product Development
- The Nature of Creative Work - HR Imperatives

Unit 5 Strategic Aspects of Design and Product Development (weeks 11-12)

- Sustainable Products - Green Design – Cradle-to-Cradle
- Patenting and Protection
- Open Innovation, Crowd Models, User Involvement
- Competing through Design and Lean Product Development

Final Project Presentation and Revision (week 13)

- **Recommended or required readings**



Ulrich, K. & Eppinger, S. (2011),* Product Design and Development*, McGraw-Hill Higher Education; 5 edition.



Henry, K. (2012), Drawing for Product Designers*, Laurence King*



Lefteri, C. (2012), Making It: Manufacturing Techniques for Product Design*, Laurence King; 2 edition.*



Mascitelli, R. (2007), The Lean Product Development Guidebook: Everything Your Design Team Needs to Improve Efficiency and Slash Time-to-Market, *Technology Perspectives.*



Electronic articles from the AUEB Electronic Journal Library: http://www.lib.aueb.gr/

- **Planned learning activities and teaching methods**

Teaching methods include lectures on theories and concepts, tutorial sessions on case studies and software applications, as well as application exercises on tools and methods for product design and development. Student presentations of selected topics, final group project and field visits are also part of the teaching methods.

- **Assessment methods and criteria**

1. 20%: Individual Theme Essay
2. 20%: Point System related to the successive development of the team project – Student presentations in weeks 4, 6 and 8.
3. 20%: Final Project Deliverable
4. 40%: Final Written Exam.

- **Language of instruction**

Greek

- **Work placement(s)**

N.A.