Erasmus Curriculum Development Project
Supporting the Ecodesign Education For Engineers

Anca BARSAN
ECO-DESIGN – AN INNOVATIVE PATH TOWARDS SUSTAINABLE DEVELOPMENT

51388 - IC -1-2005-1- RO - ERASMUS – MOD
Why ECO-DESIGN in engineering education?

- Protection of the environment is one of the major challenges facing Europe. Starting with 1976, the UE adopted more than 200 pieces of legislation, mainly concerned with limiting pollution by introducing minimum standards, notably for waste management, water pollution and air pollution.

- The main sources of education in product design and design engineering are technical universities. It can be appreciated that the environmental issues are taught minimally at these establishments, there is no information and coherent education and training for engineers.

- In order to face to the new demands of the labor market considering the 2007 Romania’s integration in EU, it is an urgent need to improve the engineering curricula towards a more life-cycle oriented approach where important environmental aspects and working tools are truly integrated.
Why an Erasmus-MOD project?

- Beginning with the academic year 1998-1999, in Transilvania University of Brasov, Faculty of Technological Engineering, a course of Industrial Design started (in Romanian and from 2000-in English also).

- The coordinating committee of this course considered, that according to the European demands, it is necessary to introduce in the curriculum an eco-design module. Also, parts of this module is useful to be taught to all the engineering students from Transilvania University (Automotive Engineering, Environmental Science and Management, Civil Engineering).

- It was necessary to search an European partnership, in order to develop a module at European level, considering the most experimented institutions and departments.
PROJECT HISTORY

2004
- Formulation of the idea of the project

beginning 2005
- Partners’ search

end of February 2005
- Proposal submission to Brussels

end of August 2005
- Announcement that the project was granted
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Coordinator: Transilvania University of Brasov, ROMANIA

Partners:
- Technological Educational Institution of Athens, GREECE
- Technical University Wien, AUSTRIA
- University of Brighton, UNITED KINGDOM
- Tallinn University of Technology, ESTONIA
- University of Bacau, ROMANIA
- “Petru Maior” University of Targu Mures, ROMANIA
THE AIM OF THE CD-MOD PROJECT:

To improve and enrich the curriculum of Engineering courses, especially that of Industrial Design and Environmental Engineering, in all the partner institutions, at undergraduate level, considering the actual demands for a sustainable development, by implementing an European module of Ecodesign.
The objectives to support this aim are:

- The development of the curriculum of the Eco-Design Module;
- The development of the syllabi for four subjects:
  - Eco-design: Fundamentals;
  - Product Life Cycle Assessment;
  - Product Recycling Technologies;
  - Embedding Eco-Design in Product Development;
- The development of the appropriate teaching aids (manuals and CD) for these four modules.
The supporting objectives are:

• The selection of the human resources for developing the Eco-Design core, during and after the project’s lifetime;

• The improving and updating of the existing infrastructure in the partner institution for the optimum development of the project;

• The evaluation, internally and externally, of the projects activities and outcomes;

• The dissemination of the project’s outcomes through the partners and outside the partnership;

• The implementing of the subjects (totally and/or partially) in the current Industrial Design Engineering and/or other courses curricula.
ECODESIGN MODULE

ECODESIGN: FUNDAMENTALS

LIFE CYCLE ASSESSMENT

PRODUCT RECYCLING TECHNOLOGIES

EMBEDDING ECODESIGN IN PRODUCT DEVELOPMENT

It could be implemented in any engineering courses.

It could be implemented only after studying the other three subjects of the cluster.
Ecodesign Project Activities

First year - Development of the teaching aids
- Needs Analysis
- Equipment acquisition
- Material collection
- Defining the syllabi for the four modules
- Development of the first form of the teaching aids

Second year – Implementation of the ECODESIGN MODULE
- Testing and implementation mobility flows
- Development of the final form of teaching aids
- Evaluation of the teaching aids
- Publishing of the teaching aids (manuals and CD)
- Certification procedure of the module implementation.

Project duration
1.10.2005-30.09.2007

Project dissemination
Ecodesign project outcomes
# THE ECODESIGN MODULE CURRICULUM

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<tr>
<th>Subject</th>
<th>Semester</th>
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ECODESIGN Fundamentals
(course and seminar)

The subject intends to increase students’ awareness regarding product development, considering the environmental constrains. This subject can be included in all engineering courses as an introduction in the field of ecodesign.

Syllabus
1. Why ecodesign?
2. Environment in product life-cycle
3. Eco-alternatives in product life cycle
4. Designing Eco-products
5. Eco-product management
Life Cycle Assessment  
(course and laboratory)

The second subject of the Ecodesign Module intends to improve students’ knowledge regarding the product life cycle analyze and to present them some methods and tools to find more environmentally friendly design solutions for a product. They are taught how to use software for the product environmental impact assessment (SimaPro 7)
Life Cycle Assessment
(course and laboratory)

Syllabus

• Introduction
• Material production, use of raw materials
• Product manufacture
• Transport
• Product Use
• Product's end of life
• Life Cycle Assessment (LCA)
• Environmental assessment tools
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TOWARDS SUSTAINABLE DEVELOPMENT

Product Recycling Technologies
(course and laboratory)

The subject intends to improve students’ knowledge regarding the recycling technologies of a product, with the aim to design products less harmful for the environment.

Syllabus

1. Introduction to recycling
2. Recycling technologies and equipment
3. Recycling different materials and products
4. Product design for recycling
5. Recycling management
Embedding Ecodesign in Product Development
(course and project)

The subject represents, for the students, a guide of how to analyze a product, considering its environmental impact and how to improve its design to be less harmful for the nature.
Embedding Ecodesign in Product Development

Syllabus

1. Introduction into Ecodesign
2. Modelling the Life Cycle of a product
3. Evaluating with MET matrix, energy values and ECODESIGN PILOT’s Assistant
4. Mandatory requirements, EU directives, voluntary Requirements, eco-labeling
5. Finding improvement strategies
6. Integrating ecodesign in the product development process
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Manuals for the four subjects

• Each book has around 200 pages
• The content is divided into 14 lessons, corresponding to the 14 weeks of an academic semester in Romanian universities
• At the beginning of each lesson, the lesson objectives are presented and, at the end of each lesson, some home exercises or supplementary readings are suggested.
• The material is exposed very clearly and the books are very attractive and accessible for the undergraduate students
• The manuals language was corrected by the English partner
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Manuals for the four subjects

To have a **funny journey** in the field of ecodesign, we have a nature loving guide, **ED**. He is the **EcoDesigner**
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TOWARDS SUSTAINABLE DEVELOPMENT

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A CD for each subject, containing:
The manual (pdf)
The teaching slides
Case studies
Additional materials
Glossary (Vienna University of Technology and Brighton University)
ECODESIGN FOR SUSTAINABLE DEVELOPMENT

Volume I: Fundamentals

Editors:
A. Barsan, L. Barsan
Transilvania University of Brasov

ERASMUS PROJECT: ECO-DESIGN: AN INNOVATIVE PATH TOWARDS SUSTAINABLE DEVELOPMENT
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ERASMUS multilateral projects - Curriculum Development 2000-2010

Curriculum development projects are designed to support the process of innovation and upgrading in higher education teaching. They may be proposed in any academic discipline.

By combining the expertise and state-of-the-art knowledge of higher education institutions from at least three eligible countries participating in the LLP, such projects can make a significant contribution to reinforcing the quality and European dimension of higher education teaching.

Statistics

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