**Syllabus**

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| Discipline’s code | Discipline’s title |  | Number of ECTS | SWSTSelf-work of student with teacher, in hours | SWSTSelf-work of student without teacher, in hours |
| Lect. | Pract. | Lab. |
|  | **Ecological design** | **30** | **10** | **0** | **4 (12­0 hours)** | **6** | **74** |

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| Academic presentation of the course | **Aim of course:** To deepen and to improve skills for using main eco-design principles and strategies in product development phase. **As a result of studying the discipline, students should be able to:*** Get knowledge on main eco-design strategies and motivators, “life cycle thinking” concept;
* Gain skills to use different methods of environmental impact evaluation, which allows to evaluate product environmental impact and product performance;
* apply different eco-design tools in different industry sectors;
* decrease or eliminate negative environmental impact in the whole life cycle of a product;
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| Prerequisites | Environmental Physics; Prevention of Environmental pollution; Sustainable Environment; Material Sciences; Waste Management and Reuse Technologies;  |
|  |  |
| Information resources  | * Rodrigues, Vinicius P.; Pigosso, Daniela C. A.; McAloone, Tim C. Process-related key performance indicators for measuring sustainability performance of ecodesign implementation into product development.
* Dalhammar, Carl. Industry attitudes towards ecodesign standards for improved resource efficiency.
* di Sorrentino, Eugenia Polizzi; Woelbert, Eva; Sala, Serenella. Consumers and their behavior: state of the art in
* Pigosso, D. C. A.; McAloone, T. C.; Rozenfeld, H. Characterization of the State-of-the-art and Identification of
* Main Trends for Ecodesign Tools and Methods: Classifying Three Decades of Research and Implementation.
* Lewis, H., Gertsakis, J. "Design+environment: a global guide to designing green goods". Greanleaf publishing. Shefield, UK. ISBN 1874719438
 |
| Web sources | * Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products <https://eur-lex.europa.eu/eli/dir/2009/125/oj>
* Lewandowska, Anna; Matuszak-Flejszman, Alina. Eco-design as a normative element of Environmental Management Systems-the context of the revised ISO 14001:2015. <https://researchgate.net>
* Brones, Fabien; de Carvalho, Manly Monteiro; Zancul, Eduardo de Senzi. Ecodesign in project management: a missing link for the integration of sustainability in product development. <https://apps.webofknowledge.com>
* Brones, Fabien; de Carvalho, Marly Monteiro. From 50 to 1: integrating literature toward a systemic ecodesign model. <https://apps.webofknowledge.com>
* MacDonald, Erin F.; She, Jinjuan. Seven cognitive concepts for successful eco-design. <https://apps.webofknowledge.com>
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Calendar (schedule) the implementation of the course content**:**

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| --- | --- | --- | --- |
| **Week** | **Topic title (lectures, practical classes, Independent work of students, IWS)** | **Number of hours** | **Maximum score** |
| *1* | *2* | *3* | *4* |
|  | Lecture. Origins and development of Eco-design | 2 | 4 |
| Practical class. The applicability of the eco-design method | 2 | 4 |
|  | Product environmental policy. EU policy on product development | 2 | 4 |
|  | Industrial technologies of ecological product for different objects | 2 | 4 |
|  | Eco-design strategy | 2 | 4 |
| Practical class. Evaluation of selected ecological product | 2 | 4 |
|  | Eco-design tools and techniques  | 2 | 4 |
|  | Product life-cycle concept | 2 | 4 |
|  | Eco-design as a tool in the manufacturing and services sectors | 2 | 4 |
| Practical class. Virtual modelling of ecological product | 2 | 4 |
|  | Life Cycle Assessment | 2 | 4 |
|  | Product Environmental Impact Assessment | 2 | 4 |
|  | Product eco-design methodology | 2 | 4 |
| Practical class. Ecological product creating | 2 | 8 |
|  | Evaluation and improvement of eco-design process and integrated evaluation of eco-design system | 2 | 4 |
|  | Advanced technologies of the ecological product creating | 2 | 4 |
|  | Eco-design management. Ecological product marketing in Caspian sea region | 2 | 4 |
| Practical class. Scientific seminar – presentation of ecological product | 2 | 20 |
|  | Integrated evaluation of eco-design system | 2 | 4 |
|  | Product-service systems | 2 | 4 |
|  |  |  | **SUM: 100** |
|  | Self-work of student without teacher: Preparation to the Scientific seminar | 30 |  |
|  | Self-work of student without teacher: Preparation to the Control work | 20 |  |
|  | Self-work of student without teacher: Preparation to the exam | 24 |  |
|  |  |  |  |
|   | Self-work of student with teacher: Individual consultations | 6 |  |