



Azerbaijan Architecture and Construction University
Master's Center

“Confirmed by”:

Director of the Master's Center:
_____ dos. R.Y.Samedov
“15” february 2023

“Life Cycle Thinking and Sustainable Management”
Discipline
Education program
(syllabus)

Specialty(<i>code and name</i>)	02_WORK4CE
<i>1. Information about discipline</i>	
Name of discipline	“Life Cycle Thinking and Sustainable Management”
Academic language	<i>English</i>
Academic year	<i>2024</i>
Semestr	<i>Spring</i>
Type of education	<i>Full time</i>
Educational stage	<i>Master</i>
Group	
Educational load	<i>30 hours</i>
Subject’s teaching days	<i>Friday</i>
Number of training weeks	<i>15</i>
Lecture-hall	<i>№751, I branch</i>
<i>2. Information about lecturer</i>	
Lecturer	<i>Senior Lecturer Famil Mammadov</i>
<i>e- mail adress</i>	<i>Sarkhan.talibzade@azmiu.edu.az</i>
Phone number	<i>Mobile:+994 work:</i>

Baku – 2024

I. Course Prescription

The module starts with an introduction to the reasons for discussing about sustainability. Climate change and materials scarcity are some of the problems already affecting the economy and the wellbeing.

The design phase of new products and processes is affected by material scarcity - current and foreseen - and should also consider the impact that those products will have on climate change. Furthermore, the design phase should not be considered the starting phase of a lineal process, but as a entry point for a circular one. Cradle to Grave linear paradigm has already been converted to a circular Cradle to Cradle one. In March 2020 the European Union adopted the Circular Economy Action Plan; another institutional effort to create growth while reducing the pressure on resources.

Engineers and project managers need tools to address these new challenges. Among them, Life Cycle Analysis and Ecodesign shine with their own light.

In this module both tools will be presented and embedded into the circular economy design - production - recovery process.

II. Overall Learning Outcome:

2.2 Knowledge

- The student defines the concept of ecodesign and becomes aware of the environmental economic and social and is aware of the environmental, economic and social implications of product design.
- The student lists the advantages of integrating environmental criteria into the product development process.
- The student knows and understands the different regulations and technical specifications for ecodesign within an European framework.
- The student understands the origin and need of Life Cycle thinking.

2.3 Skills

- The student applies the ecodesign methodology and manages the available tools for ecodesign .
- The student positions ecodesign within the business organization in the framework of the product development process.
- The student reports the current environmental problems associated with products and services.
- The student defines the life cycle concept and identify the phases of the life cycle of a product.
- The student describes the fundamentals and regulations of the Life Cycle Analysis.
- The student applies evaluation methodologies and software tools for product life cycle analysis.

2.4 Competence – ability & attitude

- The student evaluates the life cycle analysis developed by others.

III. Plan of lectures, subject matter and training schedule

№	Date	The topic of lecture and code of literature	Auditorium Hours
1	2	3	4
1	23.02.2024 01.03.2024	<p>Topic 1: Theoretical Foundations of Sustainable Development</p> <ul style="list-style-type: none"> • Introduction to sustainability concepts and definitions. • Historical evolution of sustainable development theories. • Key principles and frameworks (e.g., Brundtland Report, Triple Bottom Line). • Critiques and debates in sustainable development theory. 	4
2	08.03.2024	<p>Topic 2: International Frameworks and Agreements</p> <ul style="list-style-type: none"> • Overview of major international organizations involved in sustainability (UN, World Bank, etc.). • Analysis of key international agreements (Paris Agreement, Agenda 2030). • Case studies on successful international collaborations in sustainable development. • Challenges and limitations of international cooperation in sustainability efforts. 	2
3	15.03.2024 22.03.2024	<p>Topic 3: Global Challenges and Their Impact on Sustainability</p> <ul style="list-style-type: none"> • Identify and analyze global challenges (climate change, biodiversity loss, etc.). • Evaluate their socio-economic and environmental impacts. • Discuss resilience strategies and adaptation measures. • Explore the role of technology and innovation in addressing global challenges. 	4
4	29.03.2024 05.04.2024	<p>Topic 4: Ensuring Sustainable Development of Socio-Economic Systems</p> <ul style="list-style-type: none"> • Strategies for integrating sustainability into economic development. • Case studies on sustainable urban development and rural resilience. 	4

		<ul style="list-style-type: none"> • Policies and practices for sustainable consumption and production. • Economic incentives and regulatory frameworks promoting sustainability. 	
5	12.04.2024	<p>Topic 5: Programmatic Approaches to Sustainable Development</p> <ul style="list-style-type: none"> • Implementing sustainable development goals (SDGs) at regional and national levels. • Assessing the effectiveness of development programs in achieving sustainability. • Case studies on successful sustainable development initiatives. • Stakeholder engagement and community involvement in sustainable programs. 	2
6	19.04.2024 26.04.2024	<p>Topic 6: Social Potential Assessment at State and Regional Levels</p> <ul style="list-style-type: none"> • Methods and tools for assessing social capital and human development. • Case studies on social impact assessments and community well-being. • Strategies for enhancing social inclusivity and equity in development projects. • Role of education and health in sustainable human development. 	4
7	03.05.2024	<p>Topic 7: Territorial Migration Systems and Sustainable Development</p> <ul style="list-style-type: none"> • Analyze the impact of migration on socio-economic and environmental systems. • Case studies on migration patterns and their implications for sustainable development. • Policies and practices for integrating migrants into sustainable communities. • Role of migration in fostering cultural diversity and resilience. 	2
8	10.05.2024 17.05.2024	<p>Topic 8: Energy Considerations in Sustainable Development</p> <ul style="list-style-type: none"> • Overview of energy sources and their environmental impacts. • Strategies for transitioning to renewable energy and enhancing energy efficiency. • Policy frameworks and international agreements addressing energy sustainability. 	4

		<ul style="list-style-type: none"> • Case studies on successful energy transition projects and their outcomes. 	
9	24.05.2024 31.05.2024	<p>Topic 9: Economic Mechanisms for Rational Nature Management</p> <ul style="list-style-type: none"> • Economic principles and tools for valuing natural capital. • Strategies for sustainable resource management and conservation. • Role of market incentives and regulations in promoting sustainable practices. • Case studies on economic success stories in natural resource management. 	4
		Total	30

IV. Coursework and their features

There is no coursework in the subject program.

V. Free work

Topics for free work of students.

In the learning process, students' knowledge of the subject is assessed by oral or written answers to theoretical questions posed by the subject teacher during lectures and lessons, as well as an oral examination on the ability to apply the knowledge in practical issues. Tests and discussions are organized by the teacher of the subject in order to check the quality of assimilation. The topics of free work performed by students are given by the teacher who teaches the subject, and may include the following topics:

- **Eco-design and Sustainable Product Development**
 - Principles of eco-design and its role in minimizing environmental impacts.
 - Case studies on sustainable product development processes.
 - Strategies for integrating eco-design into business practices.
- **Biodiversity Conservation and Sustainable Land Use**
 - Importance of biodiversity conservation for sustainable development.
 - Strategies for integrating biodiversity considerations into land use planning.
 - Case studies on successful biodiversity conservation projects.
- **Water Resource Management and Sustainability**
 - Challenges and solutions in sustainable water resource management.
 - Role of technology and policy in water conservation efforts.
 - Case studies on sustainable water management practices in different regions.

- **Sustainable Tourism and Destination Management**
 - Principles of sustainable tourism and its economic, social, and environmental impacts.
 - Strategies for promoting responsible tourism practices.
 - Case studies on sustainable tourism destinations and initiatives.

- **Waste Management and Resource Efficiency**
 - Strategies for reducing, reusing, and recycling waste materials.
 - Circular economy approaches to waste management.
 - Case studies on innovative waste management practices.

- **Climate Change Adaptation and Mitigation Strategies**
 - Assessing the impacts of climate change on different sectors.
 - Strategies for climate change adaptation and mitigation.
 - Case studies on successful climate resilience and mitigation projects.

- **Ethics and Social Responsibility in Sustainable Development**
 - Ethical considerations in sustainable development practices.
 - Role of corporate social responsibility (CSR) in promoting ethical practices.
 - Case studies on ethical dilemmas and solutions in sustainable development.

- **Community Engagement and Stakeholder Participation**
 - Importance of community engagement in sustainable development projects.
 - Strategies for fostering stakeholder participation and collaboration.
 - Case studies on successful community-led sustainable development initiatives.

- **Green Finance and Sustainable Investment**
 - Overview of green finance and sustainable investment opportunities.
 - Role of financial institutions and investors in promoting sustainability.
 - Case studies on green bonds, impact investing, and sustainable finance models.

VI. assessment

Student's final score is calculated by the maximum 100 points.
Of these, the student earns 50 points during the semester and 50 points in the exam.

50 points scored during the semester include:

- for the duration of the course - 10 points;
- free works - 10 points;
- According to the results of classes - 30 points.

50 points scored before the exam in the semester include:

- for the attendance of the course - 10 points;
- according to the results of seminars - 30 points;
- for free works (1 point for one free work) - 10 points;

The number of points scored by the student in the exam must be at least 17. Student knowledge is evaluated in accordance with the European credit transfer system (ECTS) in accordance with the following table:

91 – 100 points	A	Excellent
81 – 90 points	B	Very good
71 – 80 points	C	Good
61 – 70 points	D	Enough
51 – 60 points	E	Satisfactory
Less than 51	F	Insufficient

Violation of the rules of conduct. The student must be attentive and active in the educational process, must observe hygiene and should be engaged only in the training of the course. It is necessary to observe ethical standards accepted in society and legal norms existing in our country. If a student violates the rules of disciplinary action, he / she will be punished in the manner prescribed by the University Regulation.

VII. Teaching materials

Basic bibliography

- Global Footprint Network, Ecological Footprint Accounting: Building a Winning Hand. Global Footprint Network, 2007.
- Guidance on Organizational Life Cycle Assessment. Life Cycle Initiative. UNEP SETAC, 2015.
- ISO 14006:2020 Environmental management systems — Guidelines for incorporating ecodesign: <https://www.iso.org/standard/72644.html>.
- The European Green Deal - Plan de Acción de Economía Circular: https://ec.europa.eu/commission/presscorner/detail/es/ip_20_420
- Basque Ecodesign Center (2013). Product Service Systems: ¿Qué pueden aportar a mi negocio? Cuaderno de Ideas nº1. Edita: Eusko Jaurlaritza /Gobierno Vasco
- Basque Ecodesign Center (2016). Ecodiseño para una Economía circular: Claves para fomentar un modelo económico sostenible. Cuaderno de Ideas nº13. Edita: Eusko Jaurlaritza / Gobierno Vasco.
- Comisión Europea (2014). Hacia una economía circular: un programa de cero residuos para Europa: SWD 206 final y SWD 211 final. Disponible en: <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=celex%3A52014DC0398>

In-depth bibliography

- Braungart M., McDonough W. Cradle to Cradle: Remaking the Way We Make Things. Farrar, Straus and Giroux, 2002.
- Guías sectoriales de Ecodiseño (Ihobe): <http://www.ihobe.eus/publicaciones/guias-sectoriales-ecodiseno>
- Comisión europea (2001). Libro verde sobre la política de productos integrada. COM (2001) 68 final. Disponible en: <https://eur-lex.europa.eu/legal-content/ES/ALL/?uri=CELEX:52001DC0068>
- PRé Consultants, Mark Goedkoop, Michiel Oeie (2000). Eco-indicator 99 methodology report.

- PRÉ Consultants, Mark Goedkoop, Michiel Oeie (2001). User Manual Introduction into LCA methodology and practice with SimaPro 5.
- Rodrigo, J., Castells, F. (2002). Electrical and Electronic Practical Ecodesign Guide. Edita: Universidad Rovira i Virgili.
- Sociedad Pública de Gestión Ambiental –IHOBE (2000). Manual Práctico de Ecodiseño. Operativa de Implantación en 7 pasos. Edita: Departamento de Ordenación del Territorio, Vivienda y Medio Ambiente, Gobierno Vasco.

Journals

- Journal of Life Cycle Assessment
- Journal of Management and Sustainability
- International Journal of Sustainable Design
- Journal of Cleaner Production
- Journal of Industrial Ecology
- Resources, Conservation and Recycling
- Sustainability
- ACS Sustainable Chemistry and Engineering
- Nature Sustainability

Websites

- <https://www.ellenmacarthurfoundation.org>
- The Circular Economy Foundation: http://economycircul.org/EN/?page_id=62
- AENOR Gestión del Ecodiseño ISO 14006: <https://www.aenor.com/certificacion/medio-ambiente/ecodiseño>
- Ihobe: <https://www.ihobe.eus/inicio>
- Basque Ecodesign Center: <http://www.basqueecodesigncenter.net/Default.aspx?IdMenu=20552758-7739-4933-b86f-8a063bb65abc&Idioma=es-ES>
- European Commission > Internal Market, Industry, Entrepreneurship and SMEs > Industry > Sustainability and circular economy > Ecodesign: https://ec.europa.eu/growth/industry/sustainability/ecodesign_en

VIII. It is planned to conduct written exam on the subject

- Note:** 1. Exams correspond to the curriculum of the subject (syllabus);
2. The number and content of exams can be changed by the subject teacher before the exam in accordance with the curriculum of the subject.

IX. Training plan of discipline

In the academic calendar, the course schedule is organized in accordance with the academic schedule of the university.

X. Studying students' views on the subject (comments and suggestions)

This employee training plan (syllabus) is in accordance with the State Standard for the Master's level Education Program of Azerbaijan Republic.

This employee training plan (syllabus) for the subject was discussed and approved at the meeting of the "Master's Center" on February 2024, protocol № _____.

Date of meeting "16" February 2024

