Circular Economy and Industry 4.0

From the 10th Of June until the 27th of July

International Diploma Course in

Ecoefficient Implementation of Technologies

- ✓ 5 practical modules
- ✓ 2 Virtual visits to national and international Industry 4.0 laboratories.
- ✓ Technical assistance to technological implementation projects
- ✓ Technological risk profiling per organization
- ✓ Simultaneous translation and bilingual documentation for the international expert sessions
- ✓ Academic certification

Pontificia Universidad Javeriana Bogotá · Emporium Partner · Fraunhofer · Zentrum für Logistik und Verkehr · sura · CIRCLE CORE Smart Circularity Performance

Approach

The international emphasis of the course will allow us to experience, from the hand of experts, the advances and developments regarding the eco-efficient implementation of technologies framed within the principles of the Circular Economy. Participants will obtain competencies focused on the management of key processes to achieve an eco-efficient implementation of technologies in their organizations. We start from the complementarity between Industry 4.0 and Circular Economy, with the intention of studying determining aspects of this relationship such as: eco-efficiency, traceability of parts and spare parts, recyclability and reuse of products, among others.

These aspects determine the possibility of an effective technological gap closure in organizations based on the consolidation of efficient investments, considering the different impacts of the implementation in its different stages. We will focus on analysing viable alternatives based on practical cases, contextualized in national and international companies and organizations, taking as a reference point the current local and global situation and highlighting aspects such as collaboration, regulatory feasibility, limitations and challenges in the context of economic recovery.

During the course we will identify the fiscal benefits depending on the eco-efficient procurement and implementation of technologies, the collaboration and co-creation channels, the impact on budgets and the specific planning of technology adoption under Circular Economy schemes. As a reference, we will investigate the deployment and effectiveness of local and international dynamic networks for the assembly and remanufacturing of technological products, as well as component and spare parts recovery systems that seek to control obsolescence and ensure the extension of the useful life of technological products.

Target

Identify alternatives for a sustainable and productive scalability based on the procurement and eco-efficient implementation of technologies.

Addressee

This diploma course is aimed for companies from different sectors in scalability processes as well as companies that produce, market and distribute technologies. It may also be of interest to employees of the public sector, educational institutions and the third sector, preferably directors or project managers belonging to R&D departments, resource management and financial units, who wish to explore alternatives for eco-efficient technology adoption for their companies and institutions in the context of the economic recovery in the country. We can admit students from the faculties of engineering and related careers, economic, administrative and human sciences, who have completed their sixth semester, with the intention of carrying out internships, graduate or postgraduate works, focused on the topics of technological procurement and implementation.

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Graduate profile

Graduates will acquire technical and practical knowledge for the implementation and eco-efficient procurement of technologies, within the framework of the complementarity between Industry 4.0 and Circular Economy to meet the challenges in the economic recovery. They will be able to plan and coordinate a technological reconversion, considering the multiple sustainable possibilities in relation to the options offered by suppliers in the framework of the dynamics of the Circular Economy for a better investment decision.

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International Experts

Ani Melkonyan
Director of the Center for Urban, Logistics and Traffic Studies
University of Duisburg

Amir Rashid
Director of the Center for Circular Economy Studies
Swedish University of Technology

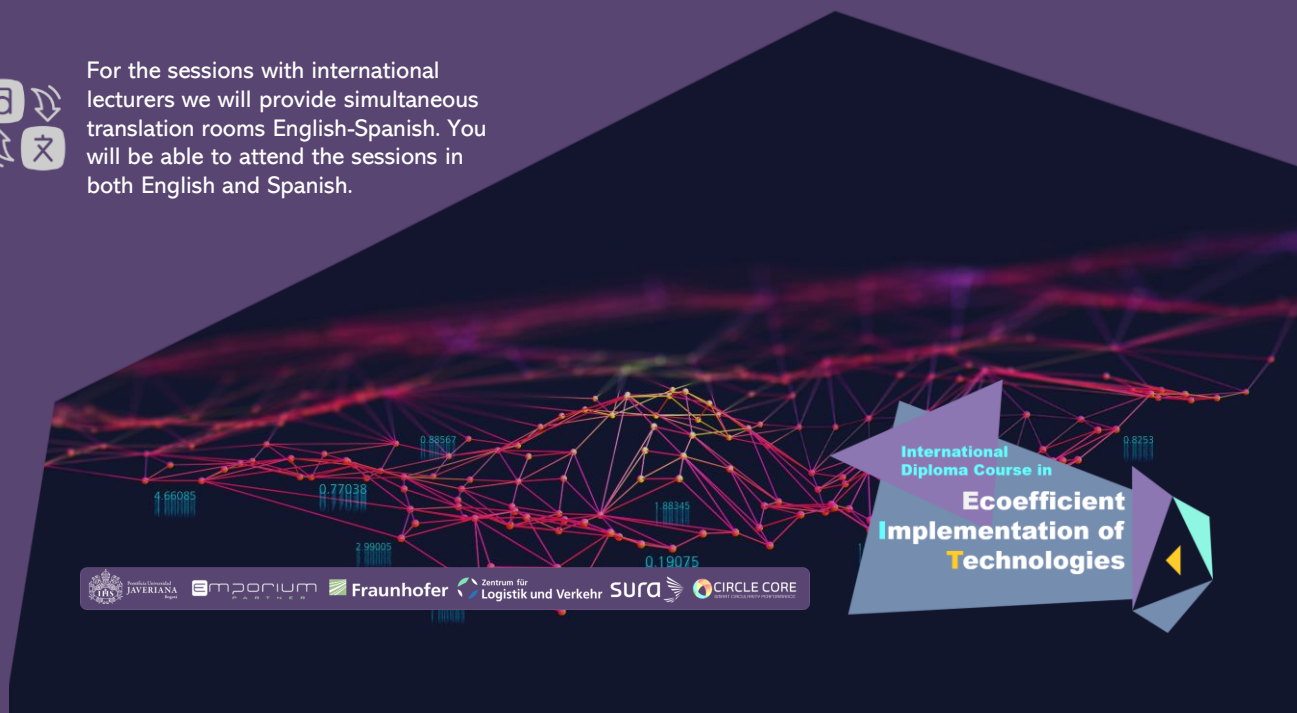
Oliver Oechsle
Director of the Regenerative Production Working Group
Fraunhofer Institute

Jan Koller
Senior Researcher working group Regenerative Production
Fraunhofer Institute

Matthias Strljic
Senior Researcher Project Retrogen RetroFit
University of Stuttgart

Carlos Pinillos
Regional Manager Circular Logistics Systems
Emporium Partners

For the sessions with international lecturers we will provide simultaneous translation rooms English-Spanish. You will be able to attend the sessions in both English and Spanish.



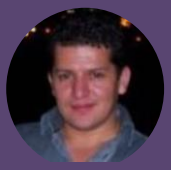
National Experts

Luis Carlos Trujillo
Director of the CEA IOT
Research Center
Pontificia Universidad Javeriana

Carlos Fuquene
Director of the CETAI
Research center
Pontificia Universidad Javeriana

Jaime Mesa
Professor of Industrial
Engineering
Pontificia Universidad Javeriana

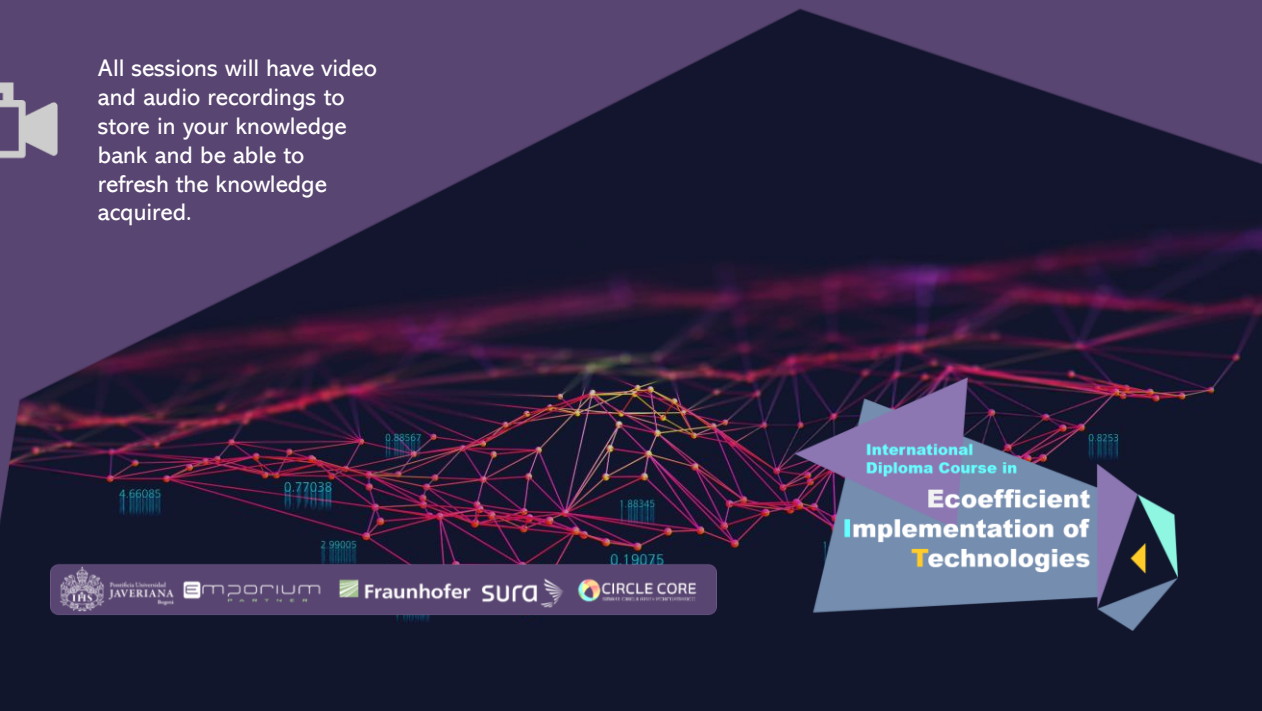
Iván Mondragón
Director of the CETAI
Research center
Pontificia Universidad Javeriana



Miguel Guevara
Specialist in Technological
Manufacturing Systems
CTO Circle Core

Ricardo Cardona
Director of the National
Rescue Center
Sura Colombia

All sessions will have video and audio recordings to store in your knowledge bank and be able to refresh the knowledge acquired.



Program

Module 1: Building the context between Circular Economy and Industry 4.0

Block 1: Eco-Circular Indicators and 9R Analysis.

1. What is circular economy?
2. Understanding Industry 4.0.
3. Circular Economy and its link with Industry 4.0.
4. What are the Sustainable Development Goals - SDGs and how do they relate to the circular economy in the context of technology implementation and procurement?
5. Observation and understanding of product life cycles.
6. Conception of a smart and eco-efficient technological product.
7. Use of assistive technologies for end-of-life management of a technological product.
8. I Case - Workshop: Product life cycle.
9. II Case - Workshop: Product life cycle.

Block 2: Basic operations in the framework of the relationship - Industry 4.0 and Circular Economy.

1. I Governance models : Production and distribution of Industry 4.0 (IoT) products in the framework of Circular Economy.
2. II Governance models : Production and distribution of Industry 4.0 (IoT) products in the framework of the Circular Economy.
3. Case study.
4. End of life of a technological product (Materials explosion, Design innovation for responsible disposal, material selection, end of life of a technological product).
5. Technology transfer models.
6. Geometric reconstruction by scanning of products for different types of maintenance (3D scanning and reverse engineering).
7. Virtual visit to the Fraunhofer Institute - Future Work Lab - in Stuttgart Germany: laboratory case analysis

Block 3: Advanced operations in the context of the relationship - Industry 4.0 and Circular Economy

1. I Description of international eco-efficient supply chains applying Industry 4.0 principles.
2. II Description of international eco-efficient supply chains applying Industry 4.0 principles.
3. Case study.
4. I Sustainable urban logistics and reverse logistics.
5. II Sustainable urban logistics and reverse logistics.
6. Case study.
7. Virtual visit to the Industry 4.0 Laboratory of the Javeriana University - Faculty of Engineering - Interactive Control Laboratory in Bogota Colombia. Instrumentation and use of an Industry 4.0 laboratory.
8. Investment in technology: eco-efficient TCO analysis.
9. Operational hedging: the key to technological circularity.
10. Traceability platforms (data storage, guarantees and shared certifications)

Fraunhofer

Visit and case reading Fraunhofer Laboratory 4.0 Germany

Pontificia Universidad JAVERIANA Bogotá

Visit and application of instrumentation Laboratorio 4.0 Universidad Javeriana Colombia

Program

Module 2: Focus on a eco-efficient technological product management

1. Incentives and fiscal benefits for the implementation of eco-efficient technologies.
2. Risk management and execution of circular economy projects.
3. Workshop: Basis for case development by organization.
4. Circular economy regulations at international level.
5. Introduction to circular manufacturing systems.
6. I Lean Remanufacturing
7. II Lean Remanufacturing

Project assistance per company

Module 3: Ecodesign and the New Circular Product

Block 1: A Mindset suitable for remanufacturing design.

1. Predictive maintenance.
2. IOT and end-of-life of a technological product.
3. Industrial robotics and machine learning for a proper end-of-life management of a technological product.

Block 2: Towards a circular quality certification in technological production - Products against obsolescence and easy assembly.

1. Eco-efficiency in both logistics and training programs based on the concept of building block construction of products.
2. Workshop: Technological product against obsolescence and easy assembly.
3. Circular Manufacturing Systems: value creation management.
4. Modeling and simulation of circular manufacturing systems.

Block 3: Dynamic manufacturing networks.

1. I Impacts on the implementation and acquisition of technologies based on co-creation and collaborative manufacturing.
2. II Impacts on the implementation and acquisition of technologies based on co-creation and collaborative manufacturing.

Block 4: Risk management in the context of new circular products.

1. Panel discussion: Impacts of the implementation and acquisition of technologies based on co-creation and collaborative manufacturing.
2. Risk management in the context of new circular products.

Session: Risk management in the context of new circular products.

Program

Module 4: Remanufacturing and reuse - Issues to be considered for technological upgrading

Block 1: Opportunities and barriers in the context of technological reuse.

1. Standardization: role of global remanufacturing councils.
2. Standardization: regulated dynamic remanufacturing networks.
3. Cores procurement and management.

Block 2: Eco-efficient investment factors in technological reuse and remanufacturing contexts.

1. Eco-efficient investment in the contexts of technological reuse and remanufacturing.
2. Understanding the concept of shared warranties.
3. Case study - Functionality: IoT-Retrofitting in medicine, the Industry 4.0 revolution in healthcare.

Block 3: Advances in Circular - Retrofit-IoT

1. I Determining the feasibility of technological reuse and remanufacturing based on systemic compatibility.
2. II Determination of the feasibility of technological reuse and remanufacturing based on systemic compatibility.

Block 4: Risk management in the context of technological remanufacturing and reuse.

1. Risk management in the context of remanufacturing and reuse.

Session: Risk management in the context of remanufacturing and reuse.

Module 5 - Workshop: risk profile for eco-efficient procurement

In the last module we will carry out an activity of accompaniment and mentoring of technological procurement and implementation projects proposed by the participants of the course, hand in hand with the experts of the program.

This will be a great opportunity to generate a specific and operative strategy of technological implementation for organizations, managing technological risk and how this will determine the opportunities for eco-efficient implementation and acquisition within the framework of economic reactivation and gap closure.

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Technological risk profile by organization

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