

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
WEST UKRAINIAN NATIONAL UNIVERSITY**

APPROVED:

Director of the B. Havrylyshyn
Education and Research
Institute of International Relations

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2025

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2025

APPROVED:

Director of the Education and Research

Institute of Innovative Educational Technologies

Sviatoslav PYTEL

2025

**WORKING PROGRAM
of the discipline**

“BASIC OF CIRCULAR ECONOMICS AND INCLUSIVITY”

Degree of Higher Education – Bachelor

Field of Study – 29 «International Relations»

Specialty – 292 International Economic Relations

Educational and Professional Program – International Economic Relations

Department of International Economic Relations

Form of study	Study year	Semester	Lectures	Seminars	Ind. work	Training	Student Self-Study	Total	Credit (semester)
Full-time	4	7	32	14	3	8	93	150	7
Part-time	4	7	8	4			138	150	7

Ternopil - WUNU
2025

The working program is compiled Candidate of Economic Science, Associate Professor
Olena Karas.

The program was approved at the meeting of the Department of International
Economics Protocol №1 from 26/08/25

Head of Department

Doctor of Economic Science, Prof.



Iryna ZVARYCH

Guarantor

Docent



Oleksandra BRATKO

STRUCTURE OF THE WORK PROGRAM OF THE EDUCATIONAL DISCIPLINE

" BASIC OF CIRCULAR ECONOMY AND INCLUSIVITY "

1. Description of the discipline

Discipline "Basic of Circular Economy and Inclusivity "	Field of knowledge, specialty, educational and professional program, higher education degree	Characteristics of the academic discipline
The number of ECTS credits is 5	29 "International Relations"	Discipline status: optional Language – English
The number of credit modules is 3	292 "International economic Relations"	Study year: 4 Semester: 7
The number of content modules is 2	Educational and Professional Program " International economic Relations "	Lectures: Full-time – 32 hrs. Part-time – 8 hrs. Practical classes: Full-time – 14 hrs. Part-time – 4 hrs.
The total number of hours is 150 hours.	Qualification: Bachelor	Self-study work: Full-time – 93 hrs Part-time – 138 hrs. Training: Full-time – 8 hrs. Individual work: Full-time – 3 hrs.
Weekly hours - 10 hours, of them classroom – 3,5 hours.		Type of final control - credit

2. Purpose and tasks of the discipline "Basic of Circular Economy and Inclusivity"

2.1. The purpose of studying the discipline

The purpose of this course is to provide students with a comprehensive understanding of the concepts, principles, and practical applications of circular economy and inclusivity.

2.2. The task of studying the discipline

The task of this course is to provide students with a fundamental understanding of circular economy and inclusivity, develop their ability to apply the 4R principles, analyze sustainable and inclusive development indicators, explore social and technological inclusion in economic transformations, and prepare them to design and evaluate business models and initiatives that promote circularity, sustainability, and equity.

2.3.As a result of studying the discipline, students should know:

- The fundamental concepts and principles of circular economy and inclusive economy.
- The 4R principles: reduce, reuse, recycle, and redesign.
- Indicators of sustainable and inclusive development.
- Key aspects of social, gender, technological, environmental, and cultural inclusion.
- Relevant international and national policy frameworks, including the European Green Deal and Circular Economy Action Plan.
- Examples of circular and inclusive business models and initiatives globally and in Ukraine.
- Practical methods for designing and evaluating circular and inclusive strategies.

2.4. As a result of studying the discipline, students should be able to:

- **explain** the concepts, principles, and significance of circular economy and inclusivity;
- **apply** the 4R principles (reduce, reuse, recycle, redesign) in practical scenarios.
- **analyze** indicators of sustainable and inclusive development;
- **assess** social, gender, technological, environmental, and cultural inclusion in economic transformations;
- **evaluate** international and national policy frameworks, including the European Green Deal and Circular Economy Action Plan;
- **design** circular and inclusive business models or projects for various sectors;
- **use** digital tools and innovative approaches to support circular and inclusive initiatives;
- **critically reflect** on case studies of global and local circular economy practices.

3. Program of the discipline "Basic of Circular Economy and Inclusivity"

Content module 1. Principles of formation and development of circular economy and inclusiveness

Topic 1. Fundamentals of Circular Economy

Definition and scope of circular economy. Differences between linear and circular economic models. Benefits of circular economy: environmental, social, and economic. Historical background and evolution of circular economy. Global and local initiatives promoting circular economy.

Literature: 1–26.

Topic 2. Explanation of inclusiveness and inclusive economy.

The concept of inclusion, broad meaning and implementation in many aspects. The goal of inclusive development.

The main areas of activity of defining the goals of inclusive development.

The process of inclusive development. Effective economic policy as an institutional factor of inclusive development of regions.

Literature: 1–26.

Topic 3. The 4R Principles: Reduce, Reuse, Recycle, Redesign

Reduce: Minimizing the use of resources and generation of waste at the source.

Reuse: Extending the lifecycle of products and materials through repeated or alternative uses. Recycle: Transforming waste materials into new products, reducing the need for virgin resources. Redesign: Innovating product and process design to enhance durability, repairability, recyclability, and overall resource efficiency. Integration of 4Rs: How the four principles work together to achieve circularity and sustainability.

Literature: 1–26.

Topic 4. Indicators of Sustainable and Inclusive Development

Sustainable Development Indicators: Economic, environmental, and social measures used to track progress toward sustainability (e.g., SDGs, resource efficiency, carbon footprint).

Inclusive Development Indicators: Metrics reflecting equity, social participation, access to opportunities, gender equality, and reduction of poverty and inequality. Composite Indicators: How multiple indicators can be combined to assess overall sustainable and inclusive performance.

National and Global Frameworks: UN Sustainable Development Goals (SDGs), World Bank inclusion indicators, national statistics.

Literature: 1–26.

Topic 5. Inclusion in Circular Transformation.

Social Inclusion: Ensuring that all individuals and groups, especially marginalized populations, have access to economic opportunities, resources, and decision-making processes.

Circular Transformation: Transitioning from linear to circular economic models while considering social equity.

Inclusive Practices in CE: Fair labor practices, community engagement, participatory decision-making, and support for vulnerable groups.

Global and Local Examples: Case studies showing successful integration of social inclusion in circular economy initiatives (e.g., Brazil's Bolsa Família, India's NREGA, South Africa's social grants).

Literature: 1–26.

Content module 2. Contemporary Strategies and Instruments of Circular and Inclusive Economy Development

Topic 6. European Green Deal and CE Action Plan

European Green Deal (EGD): EU strategy for sustainable growth, aiming to make Europe climate-neutral by 2050.

Circular Economy Action Plan (CEAP): Part of the Green Deal, focusing on sustainable product policies, waste reduction, and resource efficiency.

Key Priorities of CEAP: sustainable product design; circularity in supply chains; waste prevention and management; encouraging recycling and reuse.

Impact on Inclusivity: how EU policies support social and economic inclusion through green jobs, innovation, and fair resource distribution.

Literature: 1–26.

Topic 7. Digital Tools for Circular Inclusion

Digitalization in Circular Economy: Use of ICT, IoT, big data, and digital platforms to optimize resource use and track circular processes.

Tools for Monitoring and Reporting: Software and platforms for tracking material flows, waste reduction, and product lifecycle management.

Enhancing Inclusivity through Digital Tools: Online platforms for e-residency, digital marketplaces, remote participation, and access to resources. Global Examples. Literature: 1–26.

Topic 8. Circular and Inclusiveness Economy in Ukraine

Overview of Circular Economy in Ukraine: National initiatives, legislation, and policies promoting resource efficiency and waste reduction.

Inclusive Economy Practices: Social programs, gender inclusion, and regional development initiatives supporting equitable growth.

Challenges and Barriers: Economic, technological, and institutional obstacles to circular and inclusive development.

Opportunities and Innovations: Green jobs, sustainable business models, digital tools, and community-based circular projects.

Case Studies: examples of Ukrainian enterprises, municipalities, or projects implementing circular and inclusive practices.

Literature: 1–26.

Topic 9. Business Models in the Context of Circular Inclusivity

Circular Business Models: Product-as-a-service, sharing economy, repair and modular design, remanufacturing, and closed-loop systems.

Inclusive Business Models: Strategies ensuring participation, employment, and benefits for marginalized or underserved communities.

Integration of Circularity and Inclusivity: How businesses can simultaneously reduce environmental impact and promote social equity. Global and Local Examples.

Literature: 1–26.

4. The structure of the course credit
"Basic of Circular Economy and Inclusivity"

Full-time

Course topics	Number of hours					
	Lectures	Seminars	Ind. w.	Training	SSW	Control activities
Content module 1. Principles of formation and development of circular economy and inclusiveness						
Topic 1. Fundamentals of Circular Economy	4	2	1	4	10	Tests, essays, case studies
Topic 2. Explanation of inclusiveness and inclusive economy.	4	1			10	Essays, case studies
Topic 3. The 4R Principles: Reduce, Reuse, Recycle, Redesign	2	1			10	Practical task, presentation
Topic 4. Indicators of Sustainable and Inclusive Development	4	2			10	Reports, mini-research
Topic 5. Inclusion in Circular Transformation.	2	1			10	Discussion, case study
Content module 2. Contemporary Strategies and Instruments of Circular and Inclusive Economy Development						
Topic 6. European Green Deal and CE Action Plan	4	2	2	4	10	Group project
Topic 7. Digital Tools for Circular Inclusion	4	2			10	Presentation
Topic 8. Circular and Inclusiveness Economy in Ukraine	4	2			11	Analytical memo
Topic 9. Business Models in the Context of Circular Inclusivity	4	1			12	Model, pitch, defense
Total	32	14	3	8	93	150

Course topics	Number of hours					
	Lectures	Seminars	Ind. w.	Training	SSW	Control activities
Content module 1. Principles of formation and development of circular economy and inclusiveness						
Topic 1. Fundamentals of Circular Economy	2	2			15	Tests, essays, case studies
Topic 2. Explanation of inclusiveness and inclusive economy.					15	Essays, case studies
Topic 3. The 4R Principles: Reduce, Reuse, Recycle, Redesign	2				15	Practical task, presentation
Topic 4. Indicators of Sustainable and Inclusive Development					16	Reports, mini-research
Topic 5. Inclusion in Circular Transformation.					16	Discussion, case study
Content module 2. Contemporary Strategies and Instruments of Circular and Inclusive Economy Development						
Topic 6. European Green Deal and CE Action Plan	2	2			15	Group project
Topic 7. Digital Tools for Circular Inclusion					15	Presentation
Topic 8. Circular and Inclusiveness Economy in Ukraine	2				16	Analytical memo
Topic 9. Business Models in the Context of Circular Inclusivity					15	Model, pitch, defense
Total	8	4	-	-	138	150

5. Topics of practical classes

Practical lesson 1

Topic: Fundamentals of Circular Economy.

Purpose: to understand the essence, principles, and benefits of the circular economy compared to the linear model.

Questions for discussion:

1. What is the definition of the circular economy?
2. How does the circular model differ from the linear “take–make–dispose” model?
3. What are the main environmental, social, and economic benefits of the circular economy?
4. What historical stages influenced the emergence and development of the circular economy concept?
5. Which global and local initiatives support the transition toward a circular economy? Provide examples.

Practical lesson 2

Topic: Explanation of inclusiveness and inclusive economy.

Purpose: to define the concept of inclusion and explain the essence of the inclusive economy in the modern world.

Questions for discussion:

1. What is inclusion and how is it broadly understood?
2. What is the goal and main tasks of inclusive development?
3. What are the key areas of activity in defining the goals of inclusive development?
4. How does the process of inclusive development unfold?
5. Why is effective economic policy an institutional factor for the inclusive development of regions?

Practical lesson 3

Topic: The 4R Principles: Reduce, Reuse, Recycle, Redesign.

Purpose: to analyze the main principles of the circular economy and their role in achieving sustainability.

Questions for discussion:

1. What does the principle of *Reduce* mean in practice? Give examples.
2. How does *Reuse* extend the lifecycle of products and materials?
3. What is the role of *Recycling* in saving natural resources?
4. Why is *Redesign* important for innovation and sustainability?
5. How do the four principles integrate to achieve circularity?

Practical lesson 4

Topic: Indicators of Sustainable and Inclusive Development.

Purpose: to study the key economic, social, and environmental indicators that measure sustainable and inclusive growth.

Questions for discussion:

1. What are the main economic, environmental, and social indicators of sustainable development?
2. Which indicators reflect inclusiveness (e.g., equity, gender equality, poverty reduction)?
3. How can composite indicators provide a broader picture of sustainable and inclusive performance?
4. What global and national frameworks exist (e.g., SDGs, World Bank indicators)?
5. How can these indicators be applied to evaluate regional development?

Practical lesson 5

Topic: Inclusion in Circular Transformation.

Purpose: to explore how social inclusion can be integrated into the transition toward a circular economy.

Questions for discussion:

1. What is the role of social inclusion in circular transformation?
2. How can marginalized groups be involved in circular economy initiatives?
3. What inclusive practices (fair labor, participatory decision-making, community engagement) support CE?
4. How can global and local case studies illustrate successful integration of social inclusion?
5. What challenges exist in ensuring both circularity and inclusivity?

Practical lesson 6

Topic: European Green Deal and CE Action Plan.

Purpose: to analyze the main principles of the European Green Deal and the Circular Economy Action Plan, as well as their role in promoting sustainability and inclusivity.

Questions for discussion:

1. What are the main goals of the European Green Deal (EGD)?
2. How does the Circular Economy Action Plan (CEAP) contribute to sustainable growth?
3. What are the key priorities of CEAP (product design, waste prevention, supply chains)?
4. How do EU policies support inclusivity through green jobs and innovation?
5. What is the potential impact of EGD and CEAP on member states and beyond?

Practical lesson 7

Topic: Digital Tools for Circular Inclusion.

Purpose: to explore the role of digitalization in promoting circular economy and inclusive practices.

Questions for discussion:

1. How are ICT, IoT, and big data used in the circular economy?
2. What digital tools exist for monitoring and reporting circular processes?

3. How can digital platforms enhance inclusivity and access to resources?
4. Which global examples show effective use of digital tools for circular inclusion?
5. What challenges and risks may arise from digitalization in CE?

Practical lesson 8

Topic: Circular and Inclusive Economy in Ukraine.

Purpose: to study the current state, challenges, and opportunities of circular and inclusive economy development in Ukraine.

Questions for discussion:

1. What initiatives and policies in Ukraine promote circular economy principles?
2. How is inclusiveness implemented in Ukrainian economic practices?
3. What barriers prevent the development of circular and inclusive economy in Ukraine?
4. What opportunities exist for innovation, green jobs, and sustainable models?
5. Provide examples of Ukrainian case studies where circular and inclusive approaches are applied.

Practical lesson 9

Topic: Business Models in the Context of Circular Inclusivity.

Purpose: to analyze circular and inclusive business models and their integration for sustainable growth.

Questions for discussion:

1. What are the main types of circular business models (e.g., product-as-a-service, sharing economy)?
2. How do inclusive business models support marginalized communities?
3. In what ways can circularity and inclusivity be combined in business strategies?
4. Which global and local examples demonstrate the effectiveness of such models?
5. What are the challenges and advantages of implementing circular-inclusive business models?

6.SELF-STUDY WORK

The goal of SSW is to form practical skills for solving problematic tasks of the course "Basic of Circular Economy and Inclusivity". It contributes to consolidation, deepening and generalization of knowledge acquired by students during their studies.

Topics of the self-study work:

Topic	Number of hours (full time)	Number of hours (part time)
1. Fundamentals of Circular Economy: definition, scope, and historical evolution.	5	7
2. Differences between linear and circular economic models.	6	8
3. Environmental, social, and economic benefits of circular economy.	6 5	8
4. Global and local initiatives promoting circular economy.	5	8
5. Explanation of inclusiveness and inclusive economy.	5	7
6. Goals, tasks, and main areas of inclusive development.		8
7. The process of inclusive development and role of economic policy.	6	8
8. The 4R Principles: Reduce, Reuse, Recycle, Redesign – concept and application.	5	7
9. Integration of 4R principles for sustainability and circularity.	5	7
10. Indicators of sustainable development: economic, social, environmental.	5	8
11. Indicators of inclusive development and composite evaluation metrics.	6	7
12. National and global frameworks for measuring sustainable and inclusive development (e.g., SDGs, World Bank indicators).	5	7
13. Social inclusion in circular transformation: ensuring equity and access to opportunities.	4	8
14. Inclusive practices in circular economy: fair labor, participatory decision-making, community engagement.	5	8
15. European Green Deal (EGD): goals, strategies, and expected impact.	5	8
16. Circular Economy Action Plan (CEAP): priorities, sustainable product policies, and waste reduction.	5	8
17. Digital tools for circular inclusion: ICT, IoT, big data, and digital platforms.	5	8
18. Circular and inclusive economy in Ukraine: national initiatives, challenges, and case studies.	6	8
Total	93	138

7. Training

Goal: to develop practical skills in applying circular economy and inclusiveness principles in real-world contexts.

Tasks for students:

1. **Application of 4R Principles**
 - Analyze a selected product or service.
 - Identify opportunities to Reduce, Reuse, Recycle, **and** Redesign.
 - Prepare a short plan illustrating how to extend the product's lifecycle and reduce waste.
2. **Case Study Analysis: EU Circular Economy Action Plan**
 - Examine one CEAP initiative or policy.
 - Identify its objectives, methods, and impact on sustainability.
 - Discuss its applicability to local business or community contexts.
3. **Digital Tools for Circular Inclusion**
 - Use a digital platform or simulation (e.g., material flow tracking, lifecycle assessment tool).
 - Monitor and report resource use and recycling performance.
 - Prepare a brief report showing key metrics and recommendations.
4. **Designing Inclusive Circular Business Models**
 - In small groups, propose a business model that combines circularity with social inclusion.
 - Specify strategies for reducing environmental impact and ensuring benefits for marginalized groups.
 - Present a visual diagram or short pitch of the model.
5. **Analysis of Ukrainian and International Case Studies**
 - Select one local and one international example of circular-inclusive practice.
 - Identify success factors, challenges, and lessons learned.
 - Discuss how these practices can be adapted for other regions or sectors.

Assessment for training tasks (5 tasks of 20 points each)

8. Assessment tools and methods of demonstrating learning outcomes

The following assessment tools and methods of demonstrating learning outcomes are used in the process of studying the discipline "Basic of Circular Economy and Inclusivity":

- standardized tests;
- current survey;
- credit module testing and survey;
- team projects;
- analytical reports, essays;
- training
- presentations of the results of completed tasks and research;
- credit;
- other types of individual and group tasks.

9. Criteria, forms of current and final control

The final score (on a 100-point scale) from the discipline "Basic of Circular Economy and Inclusivity" is determined as a weighted average value, depending on the specific weight of each credit component:

Module 1		Module 2	Module 3
40%	40%	5%	15%
Current assessment	Modular control 1	Training	SSW
It is defined as the arithmetic average of the grades obtained during classes	1. Theoretical questions (2 questions) – max. 50 points. 2. Task (1 task) – max. 50 points.	Assessment for training tasks	It is defined as the arithmetic average of the grades obtained during the study of the discipline for self-study work (abstract, essay)

Current in-class assessment:

- **90–100 points** – demonstrates complete mastery of the learning material, presents it independently, fluently, and with well-argued reasoning during answers, provides deep and comprehensive coverage of theoretical issues;
- **75–89 points** – demonstrates sufficient mastery of the learning material, but the presentation of some issues lacks depth and argumentation, while minor inaccuracies and insignificant errors may occur;
- **65–74 points** – generally demonstrates knowledge of the material and conveys its main content, but without in-depth and comprehensive analysis, justification, and argumentation, with some significant inaccuracies and errors;
- **60–64 points** – demonstrates partial mastery of the learning material, presents it fragmentarily (without argumentation or justification), insufficiently discloses the content of theoretical issues, and makes significant inaccuracies;
- **1–59 points** – does not master the learning material and fails to disclose the content of theoretical issues.

The final grade for the current assessment of each module is determined as the arithmetic mean of the grades received during the classes within that module.

Training sessions:

- **90–100 points** – demonstrates complete mastery of the learning material, independently, fluently, and argumentatively applies it while completing training tasks, shows creativity in task performance;
- **75–89 points** – demonstrates sufficient mastery of the material, but when performing some training tasks lacks depth and argumentation of its application, allows minor inaccuracies and insignificant errors, while generally showing creativity;
- **65–74 points** – generally demonstrates mastery of the material and applies it in training tasks, but without comprehensive analysis, justification, and argumentation, with significant inaccuracies and errors, occasionally showing creativity;
- **60–64 points** – demonstrates partial mastery of the material, applies it fragmentarily (without argumentation or justification), insufficiently discloses the content of training tasks, makes significant inaccuracies, and shows no creativity;
- **1–59 points** – does not master the material, fails to disclose the content of tasks, and does not participate in collective activities during training.

SSW:

- **90–100 points** – the content fully meets established requirements, includes elements of independent research, demonstrates a high level of material mastery, and shows creativity in task performance;
- **75–89 points** – the content largely meets established requirements, though with minor shortcomings in some tasks, demonstrates proper mastery of the material, and shows creativity in task performance;
- **60–74 points** – tasks are performed at an insufficient level; student's work is general and poorly substantiated, demonstrates inadequate mastery of the material, includes significant mistakes, and only occasionally shows creativity;
- **1–59 points** – tasks are practically not completed; no independent contributions; gross mistakes in task solutions indicating a low level of mastery; student shows no creativity.

Module test, exam – forms of assessment where mastery of theoretical and practical material is evaluated on a **0–100 point scale** as the sum of points earned for tasks.

The **exam paper** consists of:

1. **Tests:**
 - 10 tests, each worth **2 points**, for a total maximum of **20 points**;
 - **2 points** – correct answer given.
2. **Problems (practical tasks):**
 - 2 problems, each worth **0–25 points**, for a total maximum of **50 points**;
 - **15–25 points** – demonstrates complete mastery, correctly solves the task, interprets results, shows independence;
 - **5–14 points** – demonstrates sufficient mastery, correctly solves the task but fails to fully answer additional questions, allows minor inaccuracies, interprets results fragmentarily (without argumentation), shows independence;
 - **1–4 points** – demonstrates incomplete mastery, solves the task fragmentarily with significant inaccuracies, presents superficially, and insufficiently discloses the content.
3. **Theoretical (problem) question:**
 - 1 theoretical question worth **0–30 points**;
 - **15–30 points** – demonstrates complete mastery, presents the material comprehensively, independently, and with argumentation, discloses the content in depth;
 - **1–14 points** – demonstrates general but incomplete mastery, presents material fragmentarily (without argumentation or justification), insufficiently discloses the content, with significant inaccuracies, unclear answers.

Rating scale:

On the ZUNU scale	On the national scale scale	According to the ECTS scale
90 – 100	perfectly	A (perfectly)
85 – 89		B (very good)
75 – 84	fine	C (fine)
65 – 74		D (satisfactorily)
60 – 64		E (enough)
35 – 59		FX (unsatisfactory with the possibility of refolding)
1 – 34		F (unsatisfactory with a mandatory repeat course)

10. Tools, equipment and software, the use of which provides for the educational discipline

№	Description	Topic
1.	Flipchart	1-9
2.	Laptop	1-9
3.	Projector	1-9
4	Package of presentation materials	1-9

RECOMMENDED SOURCES OF INFORMATION

- Olena Karas (2025). Sharing economy: socio-economic implications and development prospects olena karas International Scientific Conference The Economy Today: Current Issues and Transformational Processes. Riga, Latvia : Baltija Publishing, 220 pages. P. 35-38
- Карась О. Циркулярна економіка в умовах глобалізаційних викликів: ризики та можливості. *Актуальні проблеми сталого розвитку*, Том 2 № 4 (2025), С.111-117. [https://doi.org/10.60022/2\(4\)-13S](https://doi.org/10.60022/2(4)-13S)
- Карась О. С. Система стратегічного управління інклюзивною економікою: виклики та перспективи / О. С. Карась // Причорноморські економічні студії. – 2025. – Вип. 93. – DOI: <https://doi.org/10.32782/bses.93-5>. – Режим доступу: https://bses.in.ua/journals/2025/93_2025/7.pdf
- Pozhuiieva, T. & Shchegolevatykh, D. (2025). *Circular economy: opportunities for business development and environmental protection*. *Ekonomichnyy analiz*, Vol. 35(1). URL: <https://www.econa.org.ua/index.php/econa/article/view/6310>
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- Hryhorak M.Yu., Dzwigol Henryk, Kwilinski Aleksy, Trushkina Nataliia, Ovdiienko O.V. (2021) On the application of the concept of circular economy to ensure balanced sustainable development of the national logistics system in Ukraine // *Intellectualization of logistics and Supply Chain Management*. [Online], vol.7(8), pp.6-25, URL: <https://smart-scm.org/en/journal-7-2021/on-the-application-of-the-concept-of-circular-economy-to-ensure-balanced-sustainable-development-of-the-national-logistics-system-in-ukraine> – DOI: [https://doi.org/10.46783/smart-scm/2021-7\(8\)-1](https://doi.org/10.46783/smart-scm/2021-7(8)-1).
- Bukharina, L., Biriukov, T. and Pavlov, O. (2025) “Mechanisms of the national economy transition to a circular model of development in the conditions of Ukraine’s integration into the European economic area: tax and regulatory aspects”, *Management and Entrepreneurship: Trends of Development*, 2(32), pp. 10-33. doi: <https://doi.org/10.26661/2522-1566/2025-2/32-01>.
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 14. All Noman, A., et al. (2022). *Machine Learning and Artificial Intelligence in Circular Economy*. ArXiv preprint. URL: <https://arxiv.org/abs/2205.01042>.
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