COURSE DESCRIPTION

Fundamentals of Sustainable Development
2026-2027

1. Programme-related data

1.1. Higher education institution	**BABEŞ-BOLYAI UNIVERSITY**
1.2 Faculty	**FACULTY OF ENVIRONMENTAL SCIENCE AND ENGINEERING**
1.3. Department	Environmental Analysis and Engineering
1.4. Field	Environmental Engineering
1.5 Level of study	MA
1.6. Degree programme / Qualification	Sustainable Development and Environmental Management/ Environmental Engineering
1.7. Form of education	Învăţământ cu frecvenţă (Full-time education)

2. Course-related data

2.1. Course title			**Fundamentals of Sustainable Development**	Discipline code	NME4011
2.2. Course coordinator			Assoc. Prof., PhD Ruxandra Malina Petrescu-Mag		
2.3 Seminar coordinator			Assoc. Prof., PhD Ruxandra Malina Petrescu-Mag		
2.4. Year of study	I	2.5 Semester	2.6. Type of assessment	Colloquium	
2.7. Course status	Compulsory		2.8. Course type	Core subject	

3. Total estimated time (hours/semester of didactic activities)

3.1. Number of hours per week	**4**	of which: 3.2. course	2	3.3. seminar/ laboratory/ project	2
3.4. Total of hours in the curriculum	**56**	of which: 3.5. course	28	3.6. seminar/ laboratory	28
Time allocation for individual study (IS) and self-taught activities (ST)					**hours**
Learning from textbooks, course materials, bibliography, and notes (IS)					25
Additional research in the library, on subject-specific electronic platforms, and on-site					13
Preparing seminars/ laboratories/ projects, assignments, reports, portfolios, and essays (greater than or equal to the total number of hours specified in the course calendar for evaluation tasks)					20
Tutoring (professional guidance)					4
Other activities [i.e.: two-way communication with the course coordinator/tutor]					3
3.7. Total hours of individual study (IS) and self-taught activities (ST)				**65**	
3.8. Examination				**4**	
3.9. Total hours per semester				**125**	
3.10. Number of credits				**5**	

4. Prerequisites (if necessary)

4.1. curriculum-related	No requirements
4.2. skills-related	No requirements

5. Conditions (if necessary)

5.1. course-related	Classroom with a video projector
5.2. seminar/laboratory-related	No requirements

6.1 Competencies resulting from the completion of the degree programme ***(as referred to in the curriculum)***[1]

Professional competencies	
Competency code	**Competency**
PC2	Develop environmental policy: Develop an organisational policy on sustainable development and compliance with environmental legislation in line with policy mechanisms used in the field of environmental protection.
PC5	Interact professionally in research and professional environments: Show consideration to others as well as collegiality. Listen, give and receive feedback and respond perceptively to others, also involving staff supervision and leadership in a professional setting.
PC8	Implement environmental protection measures: Enforce environmental criteria to prevent environmental damage. Strive for the efficient use of resources in order to prevent waste and reduce costs. Motivate colleagues to take relevant steps to operate in an environmentally friendly manner.
PC12	Perform scientific research: Gain, correct or improve knowledge about phenomena by using scientific methods and techniques, based on empirical or measurable observations.
Transversal competencies	
Competency code	**Competency**
TC1	Think analytically: Produce thoughts using logic and reasoning in order to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
TC2	Work in teams: Work confidently within a group, with each doing their part in the service of the whole.

6.2. Learning outcomes relevant to the degree programme (as referred to in the curriculum)[2]

Learning outcomes targeted by the subject		
Competency code	**Knowledge and comprehension**	**Specific academic skills**
PC2, PC8, TC1, TC2	1.The student/graduate identifies and describes the principles of sustainable development, organisational environmental policies and mechanisms for promoting sustainability.	1.The student/graduate applies sustainable development principles in organisational and environmental contexts. The student/graduate develops and evaluates policies and strategies oriented towards sustainability.

[1] The professional and/or transversal skills targeted by the subject for which the course description is prepared will be copied from the curriculum of the degree programme. For each competency, the complete entry, including the competency code, will be copied with the exact wording that appears in the curriculum, without any changes. If no competency is copied from either of the two categories, the row corresponding to that category is deleted from the table.

[2] The learning outcomes relevant for the degree programme and targeted by the subject for which the course description is prepared will be listed. The entries, copied without any changes from the Curriculum by subject type (Core Subject/Specialisation Subject/Complementary Subject), are listed under the corresponding competency.

7. Subject-specific learning outcomes (referred to by each subject coordinator across the range of competencies and learning outcomes at the level of the degree programme)

Knowledge and comprehension
1. The student knows and understands the core concepts, principles, and definitions related to sustainable development.
2. The student knows and understands the historical evolution of sustainable development and the landmark international events shaping sustainability discourse.
3. The student understands the legal foundations and institutional frameworks governing sustainable development at national, EU, and global levels.
4. The student knows and understands the principles of environmental justice, including procedural and distributive dimensions.
5. The student knows and understands the theoretical models related to property rights regimes and the "tragedy of the commons".
6. The student knows and understands the EU's green policies and the role of environmental integration in sectors such as agriculture, energy, and business.
7. The student knows and understands sustainable consumption and production patterns and their local and global impacts.
Specific academic skills
1. The student is able to critically analyze the causes, consequences, benefits, and risks associated with sustainable development.
2. The student is able to evaluate trade-offs and synergies within sustainable development initiatives and policies.
3. The student is able to assess the role of demographic factors and human needs in shaping development strategies.
4. The student is able to apply concepts of sustainability and resilience in the analysis of case studies and real-world scenarios.
5.The student is able to use scientific literature and academic databases to support arguments and synthesize information.
6. The student is able to identify environmental governance mechanisms and assess the effectiveness of institutional bodies responsible for sustainability.
7. The student is able to develop and propose evidence-based solutions to sustainability challenges using an interdisciplinary approach.

8. Contents

8.1 Course	**Teaching and learning methods**	**Remarks[3]**
1. Introductory meeting Organizational aspects: a. Presentation of the course objectives; b. Information about the course organization (schedule; list of topics; requirements); c.Presentation of the participants; d. Information about the use of scientific literature resources – a demonstration on the access to databases: Scopus, Web of Science through extranet service using university network computer (the net must be available in the classroom) e. Cues concerning critical use of the information found on the Internet; 2. QUIZ: Students will be asked to write/discuss (without former preparation) a short essay that includes answers to the questions anticipating different lectures and discussions. 3. Students will be asked to choose individual study topics elaborated and presented during the next sessions. 4. Presentation of the list with the recommended readings. The focus is on the individual search of literature from all possible sources. However, selected journal papers and book chapters will be available to the course participants as PDF files.		
2-3. What does "development" mean? We will focus on several aspects such as: - Human needs, human rights, human ambitions; - How "human rights" are defined; the biological heritage – human inborn motivations. - Demographic boom (demographic dividend; China's one-child policy; Is population growth a problem?); - How do we define the basic levels of survival, comfort, and luxury? The relativity of these concepts (Grinde, 2009).		
4. A brief history of sustainable development - What is sustainable development? - Where does it come from? - What landmark events have contributed to today's notion of sustainability? - Why has it moved from a marginal to a central position today?		
5. Legal basis of sustainable development. From principle to strategy character. The functions of law in connection with sustainable development - Treaty of Functioning of the EU; - Romanian Constitution and Government Emergency Ordinance no. 195/2005 on environmental protection; - Regulatory function, the function of governing society, the function of defense, and guaranteeing human society's essential values, etc.		

[3] For example, organisational aspects, recommendations for students, specific aspects relating to the course/seminar, such as inviting experts in the field, etc.

6. Institutional/subsidiary body framework committed to sustainable development - UNEP, Commission on Sustainable Development, United Nations Department for Policy Coordination and Sustainable Development, Inter-Agency Committee on Sustainable Development, Earth Council; - Challenges in implementing multilateral environmental agreements (MEAs); - Other information related to the sources of International Environmental Law (Hard Law vs. Soft Law; Principles vs. Jurisprudence; Treaty Law vs. Customary law; The three levels of treaty-making); - Sustainable development governance timeline. Key milestones (1992-2017).		
7. The shared resources system - What are public goods? The economic theory of a situation within a shared resource system and - Property rights regimes: "The tragedy of the commons," a classical paper by Garrett Hardin (1968); real-life examples of the tragedy of the commons.		
8-9. The four principles are considered as "distilled" from the principle of sustainable development - The principle of inter-generational equity; - The principle of sustainable use; - The principle of common but differentiated responsibilities; - The principle of environmental integration; - Definition, implications, and international treaties.		
10. Equity across generations Environmental justice and sustainability - Procedural and distributive justice.		
11-12. The green face of the EU sectoral policies: agriculture, energy, and business - An Overview of Common Agriculture Policy (CAP) - Organic farming - Organic farming contribution to cross-cutting objectives "Environment" and "Climate" - The enterprise and the industry policies		
13. Sustainable consumption and production patterns		
14. Sustainable cities and resilience building. Final remarks on SD		

Bibliography

1. Biermann, F., Hickmann, T., Sénit, C. A., Beisheim, M., Bernstein, S., Chasek, P., ... & Wicke, B. (2022). Scientific evidence on the political impact of the Sustainable Development Goals. Nature Sustainability, 5(9), 795-800.
2. Calicioglu, Ö., & Bogdanski, A. (2021). Linking the bioeconomy to the 2030 sustainable development agenda: Can SDG indicators be used to monitor progress towards a sustainable bioeconomy? *New Biotechnology*, 61, 40-49.
3. Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström, J., Öhman, M. C., Shyamsundar, P., ... & Noble, I. (2013). Policy: Sustainable development goals for people and planet. *Nature*, 495(7441), 305-307.
4. Hardin, G. (1968). The tragedy of the commons. *Science,* 162(3859), 1243-1248.
5. Kroll, C., Warchold, A., & Pradhan, P. (2019). Sustainable Development Goals (SDGs): Are we successful in turning trade-offs into synergies?. Palgrave Communications, 5(1).
6. Li, X., Yu, Z., Salman, A., Ali, Q., Hafeez, M., & Aslam, M. S. (2021). The role of financial development indicators in sustainable development-environmental degradation nexus. *Environmental Science and Pollution Research*, 28(25), 33707-33718.
7. Petrescu-Mag, R.M., Petrescu, D.C., Oroian, I.G.; Safirescu, O.C., Bican-Brișan, N. (2016). Environmental Equity through Negotiation: A Case Study on Urban Landfills and the Roma Community. *Int. J. Environ. Res. Public Health*, 13, 591.
8. UN, n.d. The 17 goals https://sdgs.un.org/goals
9. Video material: https://www.youtube.com/watch?v=WYA1y405JW0 (Tragedy of the commons)

8.2. Seminar/ laboratory	**Teaching and learning methods**	**Remarks**
The goal of the seminars is to increase students' participation. This does not mean that every student will participate in the same way or at the same rate. Instead, it is about creating an environment where all students can learn. The students will explore concepts and ideas in depth in the seminars from various viewpoints, all related to sustainability. Critical discussion of causes/consequences and benefits/ risks of sustainable development. Discussion of the current economic issues in the context of the global sustainable development debate.	Conversation, debate, case studies. *Recommended strategies for the students:* Become more active in discussions and contribute more thoughtful, effective comments to help raise the overall quality of the conversation.	Please note: Reading the course materials is necessary but not sufficient to ensure meaningful participation in discussions. Students who do not engage with the course support materials and other required readings cannot contribute effectively to discussions.

Bibliography

1. Biermann, F., Hickmann, T., Sénit, C. A., Beisheim, M., Bernstein, S., Chasek, P., ... & Wicke, B. (2022). Scientific evidence on the political impact of the Sustainable Development Goals. *Nature Sustainability*, 5(9), 795-800.
2. Biglari, S., Beiglary, S., & Arthanari, T. (2022). Achieving sustainable development goals: Fact or Fiction? *Journal of Cleaner Production*, 332, 130032.
3. Kirkby, J., O'Keefe, P., & Timberlake, L. (Eds.). (2023). The Earthscan reader in sustainable development. Taylor & Francis.
4. Pauliuk, S. (2020). Making sustainability science a cumulative effort. *Nature Sustainability*, 3(1), 2-4.
5. Sachs, J., Kroll, C., Lafortune, G., Fuller, G., & Woelm, F. (2022). *Sustainable development report 2022*. Cambridge University Press.
6. Silvestre, B. S., & Ţîrcă, D. M. (2019). Innovations for sustainable development: Moving toward a sustainable future. *Journal of cleaner production*, 208, 325-332.

9. Evaluation

Type of activity	9.1 Evaluation criteria[4]	9.2 Evaluation methods[5]	9.3 Share in the grade (%)
9.4 Course	Knowledge of the milestones in sustainable development, including key concepts, the legal basis, and the EU's greening commitments.	Colloquium	50%
9.5 Seminar/lab activities	Elaboration and presentation of a research essay (research project)	To assess the project, the following elements will be considered: adherence to the deadline; paper presentation; paper appearance; paper content; and references.	30%
	Active participation in seminars	Participation in discussions/debates, preparation of the tasks. Students are rewarded for raising more challenging ideas and collaboratively addressing them.	20%
9.6 Minimum performance standards: Attendance at lectures is not mandatory, but it is recommended. The course coordinator may implement methods to monitor attendance. Students must meet the minimum participation requirements for all academic activities. The passing grade is 5 (five). Appeals regarding final results, submitted within 24 hours of the communication of the grades, are resolved by a committee appointed by the faculty management within 48 hours of the submission of the appeal.			

10. SDG labels (Sustainable Development Goals)[6]

✓ Sustainable Development Generic Label								
1 FĂRĂ SĂRĂCIE	2 FOAMETE „ZERO"	3 SĂNĂTATE ȘI BUNĂSTARE	4 EDUCAȚIE DE CALITATE	5 EGALITATE DE GEN	6 APĂ CURATĂ ȘI SANITAȚIE	7 ENERGIE CURATĂ ȘI LA PREȚURI ACCESIBILE	8 MUNCĂ DECENTĂ ȘI CREȘTERE ECONOMICĂ	9 INDUSTRIE, INOVAȚIE ȘI INFRASTRUCTURĂ
○	○	○	○	○	○	○	○	○

[4] The evaluation criteria must directly reflect the learning outcomes targeted at the level of the degree programme respectively at the level of the subject. More specifically, the learning outcomes set out in the expected learning outcomes are assessed.

[5] Both final evaluation methods and ongoing evaluation strategies should be established.

[6] Select a single label which, according to the *Implementation of SDG labels in the academic process*, best matches the subject. If the subject addresses sustainable development in a generic manner (i.e. by presenting/introducing the general framework of sustainable development, etc.), then the Sustainable Development generic label may be applied. If none of the labels describe the subject, select the last option: *"No label applies."*

								No label applies
○	○	○	○	○	○	○	○	○

Date of entry:
April 6, 2026

Signature of course coordinator

Ruxandra M. Petrescu-Mag

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Signature of seminar coordinator

Ruxandra M. Petrescu-Mag

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Date of approval in the department:

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Signature of the head of department

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