Faculty: Engineering Technology	
Department: Civil Engineering	**Program: Civil Engineering**
Academic year: 2023/2024	**Semester:1st**

Co-funded by the Erasmus+ Programme of the European Union

EU clim
Erasmus+ Jean Monnet Module

Course Plan

First: Course Information

Course No. 0902345	***Course Title:* European Climate Change Experience**	***Credit Hours: 3***
Prerequisite: 0902221	***Section No.:***	***Lecture Time: 9-10***
Type Of Course:	☐ *Obligatory Faculty Requirement* *Elective* ☐ *University Requirement* ☐ *ObligatoryUniversity Requirement* *Faculty Requirement* ☒ *Course Elective SpecialtyRequirement* *Obligatory Specialization requirement* ☐	
Type of Learning:	☒ ***Face-to-Face Learning*** ☐ ***BlendedLearning(2 Face-to-Face + 1Asynchronous)*** ☐ ***Online Learning (2 Synchronous+1 Asynchronous)***	

Second: Instructor's Information

Name: Ashraf Shaqadan		***Academic Rank: Associate Professor***	
Office Number:231 L		***Ext. Number:***	***E-mail: ashaqadan@zu.edu.jo***
Office Hours:	***Sunday 10-11*** ***Monday 09-10*** ***Tuesday 10-12*** ***Wednesday 09-10*** ***Thursday 10-11***		

Third: Course Description

The course introduces students to the European Union (EU) climate change policies and mitigation actions. EU has a comprehensive climate policy aimed at reducing greenhouse gas emissions, adapting to the impacts of climate change, and fostering the transition to a low-carbon, climate-resilient economy.
The course discusses the growing global role of EU environmental and sustainable development policies, introduces and examines the major European and global environmental issues, the

Environment Action Programme to 2030 and the renewed Sustainable Development strategy as well as the integration of environmental issues in the decisions and activities of other policy sectors.

Topics covered include Climate change, physical and chemical processes related to atmosphere, biosphere, hydrosphere and lithosphere, expected and actual consequences of climate change, greenhouse effect, global warming, effects of energy production on climate, CO2 and other greenhouse gases, climate monitoring and modelling, negative carbon emissions, sustainable development goals, actions to adapt to and mitigate climate change and its impacts.

Fourth: Learning Source

Main Reference:	• David Archer, *Global Warming Understanding the Forecast,* 2nd ed (Wiley, 2011; ISBN 978-0-470-94341-0). B sure you get the second edition because i is significantlydiffer- ent from the first. • William Nordhaus, ***The Climate Casino:*** *Risk, Uncertainty, and Economics for a Warming World* (Yale, 2013; ISBN 978-0-300-21264-8) Roger A. Pielke, Jr., *The* ***Climate Fix*** (Basic Books, 2010; ISBN 978-0-465-02519-0)	
Author:	***Issue No.:***	***Publication Year:***
Additional Sources&Websites:	• Solved Problems • Class Notes Some useful Links • European Commission, DG Environment https://ec.europa.eu/environment/index_en • EU Sustainable Development Goals https://ec.europa.eu/info/strategy/internationalstrategies/sustainable-development-goals_en • EU Environmental Strategies https://ec.europa.eu/environment/strategy_en • EU Environmental Policy summaries https://eurlex.europa.eu/summary/chapter/20.html • European Green Deal https://ec.europa.eu/info/energy-climatechange-environment_en • European Environment Agency https://www.eea.europa.eu/	

	• Organization for Economic Cooperation and Development, (OECD) • Environment Directorate - https://www.oecd.org/environment/ • IMPEL European Union Network for the Implementation and Enforcement of Environmental Law https://www.impel.eu/ • https://www.ipcc.ch/ https://nas-sites.org/climate-change/climatemodeling/page_1_1.php • https://www.wcrp-climate.org/wgcm-cmip • https://www.ecmwf.int/en/research/modelling-and-prediction • https://climate.nasa.gov/ https://climate.nasa.gov/solutions/resources/ • https://www.nobelprize.org/prizes/physics/2021/popular-information/
Teaching Type:	✱ ***lassroom L☐oratory W☐kshop MS Te☐ns Moodle*** ✱

Fifth: Learning Outcomes

Course Code	*Course Intended Learning Outcomes (CILOs)*	*Connection To Program ILOs Code*
Knowledge		
**K1	Students successfully completing this course will demonstrate the following outcomes: 1. Describe and discuss international and European policies, agreements and action plans related to climate change and sustainable development 2. Describe and appraise impacts of energy supply based on fossil and renewable energy sources on the climate system and climate change. 3. Understand and discuss the role of monitoring and modelling to describe past and present climate and predict future climate 4. Describe and evaluate causes and consequences of climate change 5. Analyse the climate system from the past development to future predictions	*PK1
K2	6. Evaluate and motivate actions to mitigate and adapt to climate change and its impact	PK2
K3		PK3
K4		PK4
K5		PK5
Skills		

***S1		PS1
S2		PS2
S3		PS3
S4		PS4
Competencies		
****C1		PC1
C2		PC2

*** P: Program, **K: knowledge, ***S: skills, ****C: competencies.**

Sixth: Course Structure

Lecture Date	(ILOs)	Module	Topics	Teaching Procedures*	TeachingMethods***	References***
1	1	Env[1]	What is Climate Change?	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 1, *Casino* Ch. 1–2
2	1	Env[1]	What is Climate Change?	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 1, *Casino* Ch. 1–2 https://www.un.org/en/climatechange/what-is-climate-change
3	1, 2	Env[1]	Energy Balance and Climate	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 2–3 pp. 9–23
4	1, 2	Env[1]	Greenhouse Effect	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 3 pp. 23–26
5	1, 2	Env[1]	Greenhouse Gases	Interactive lectures, using PPT slides/clas	lecturing, discussion, problem solving.	*Forecast* Ch. 4

				s notes, digital pen		
6	1, 2	Env[1]	Vertical Structure of the Atmosphere	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 5
7	1, 2	Env[1]	Review of Greenhouse Effect	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 4 , 5
8	1, 2	Env[1]	Ocean and Biosphere Feedbacks	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 7
9	1, 2	Env[1]	The Carbon Cycle: Ocean and Biosphere	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 8
10	1, 2	Env[1]	The Carbon Cycle: Mineral Weathering	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 8
11	3	Env[1]	Climates of the Past	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Forecast* Ch. 11 pp. 135–145,
12	3	Env[1]	Climate Models	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Casino* Ch. 3–4

	3	Env[1]	Future Climate Change	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Casino* Ch. 5, *Forecast* Ch. 12 pp. 153-164
13	3	Env[1]	How Will Climate Change Affect Our Lives? (Part 1)	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Casino* 6-9
14	3	Env[1]	How Will Climate Change Affect Our Lives? (Part 2)	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Casino* 10-12
15	4	Env[1]	Climate change impacts in Europe	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Notes
16	4	Env[1]	Climate change impacts in Europe-Spain & Italy	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Notes
17	4	Env[1]	Climate change impacts in Europe-Germany &Serbia	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Notes
18	4	Env[1]	MITIGATION AND ADAPTATION OPTIONS			Notes
19	4		**Mid exam**		-	-
20		**Eco[2]**	European Union Climate	Interactive lectures, using PPT	lecturing, discussion, problem solving.	- *Casino* Ch. 17, *Climate Fix* Ch. 6

			Change Law: Introduction -Allocation of powers -Negotiations - Implementation Governance and adjudication	slides/class notes, digital pen.		-F. Stangl/R. Mauger, EU Climate Policy, in: E. Woerdman/M. Roggenkamp/ M. Holwerda (eds.), Essential EU Climate Law, 2. edn., Cheltenham 2021, pp. 23–37 **E. Woerdman, EU Emission TradingSystem, in: E. Woerdman/M. Roggenkamp/ M. Holwerda (eds.), Essential EU Climate Law, 2. edn., Cheltenham 2021, pp. 44–73**
21	3, 4	**Eco²**	Costs and Benefits	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Casino* Ch. 18
22	3, 4	**Eco²**	Climate Finance and Stranded Assets	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	**Colgan, Jeff, Jessica F. Green, and Thomas Hale. 2020. "Asset Revaluation and the Existential Politics of Climate Change." SSRN Scholarly Paper ID 3634572. Rochester, NY: Social Science Research Network. https://papers.ssrn.com/abstract=3634572.** -Attracta Mooney and Patrick Temple-West. 2020. Financial Times. Asset Warriors Join Forces with Eco-Warriors. The Financial Times. https://www.ft.com/content/78167e0b-fdc5-461b9d95-d8e068971364
23	3, 4	**Eco²**	EU Climate policy EU Green Deal	Interactive lectures, using PPT slides/class notes,	lecturing, discussion, problem solving.	Communication from the Commission to the European Parliament, the European Council, the Council, the

				digital pen.		European Economic and Social Committee and the Committee of the Regions the European Green Deal, 2019 https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en **-Siddi, Marco. "The European Green Deal: Assessing its current state and future implementation." (2020).**
24	3, 4	**Eco²**	EU Climate policy EU Green Deal	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions the European Green Deal, 2019 **-Siddi, Marco. "The European Green Deal: Assessing its current state and future implementation." (2020).**
25	5	**Eco²**	Emission Trading Scheme	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	**Teixidó, J., Verde, S. F., & Nicolli, F. (2019). The impact of the EU Emissions Trading System on low-carbon technological change: The empirical evidence. Ecological Economics, 164, 106347. doi:10.1016/j.ecolecon.2019.06.002 10.1016/j.ecolecon.2019.06.002** **-WIFO , The Impact of Trade and Trade Policy on the Environment and the**

						Climate A Review, 2022 -Rosendahl, K. E. (2019). EU ETS and the waterbed effect. Nature Climate Change, 9(10), 734–735. doi:10.1038/s41558-019-0579-5
26	5	**Eco²**	Emission Trading Scheme	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Teixidó, J., Verde, S. F., & Nicolli, F. (2019). The impact of the EU Emissions Trading System on low-carbon technological change: The empirical evidence. Ecological Economics, 164, 106347. doi:10.1016/j.ecolecon.2019.06.002 10.1016/j.ecolecon.2019.06.002 -Verde, S. F. (2020). THE IMPACT OF THE EU EMISSIONS TRADING SYSTEM ON COMPETITIVENESS AND CARBON 6 LEAKAGE: THE ECONOMETRIC EVIDENCE. Journal of Economic Surveys. doi:10.1111/joes.12356 -Rosendahl, K. E. (2019). EU ETS and the waterbed effect. Nature Climate Change, 9(10), 734–735. doi:10.1038/s41558-019-0579-5
27	6	**Eco²**	Reducing Carbon Emissions: Bottom-Up Approaches	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Climate Fix* Ch. 4,
28	6	**Eco²**	Pricing Carbon	Interactive lectures, using PPT slides/clas	lecturing, discussion, problem solving.	*Casino* Ch. 19 **- Carbon Pricing 101**

				s notes, digital pen.		
29	6	**Eco²**	Carbon Pricing Instruments	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Handouts
30	5,6	**Eco²**	Discounting and the Value of Time	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Casino* Ch. 16, Handouts
31	5,6	**Eco²**	Climate Justice	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Handouts
32	5,6	**Eco²**	Characteristics and Principles of Climate Change Law	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	M. Faure, Economics, in: L. Rajamani/J. Peels (eds.); Oxford Handbook of International Environmental Law, 2. ed., Oxford2021, pp. 169-182
33	5,6	**Eco²**	Climate Change Law as part of International Environmental Law: Economic analysis of climate change Sources of General International Law Main subject	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	N.S. Ghaleigh, Economics and International Climate Change Law, in: C.P. Carlarne,/K.R. Gray/R. Tarasofsky(eds.); The Oxford Handbook of International Climate Change Law, Oxford 2016, pp. 72-94

			matters of international environmental law			
34	5,6	**Eco²**	Emergence of International Climate Change Law Principles of International Environmental Law Politics and history path to the United Nations Framework Convention on Climate Change (UNFCCC) climate change and human rights law	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	– B. Mayer, The International Law on Climate Change, Cambridge 2018, pp. 12-17, 33-38; 66–78 P.J. Sands/I. Millar, "Climate, International Protection", MPEPIL 2011,N 1–23
35	6	**Eco²**	Treaties-based regime: Institutions and Protocols Intergovernmental Panel on Climate Change (IPCC) Conferences of the Parties (COP) • Kyoto Protocol Doha Amendment	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	B. Mayer, The International Law on Climate Change, Cambridge 2018, pp.39-45; 132-139 D. Bodansky/J. Brunnée/L. Rajamani,International Climate Change Law, Oxford 2017, pp. 105–117

36	6	**Eco²**	Paris Agreement on Climate Change (I) - International relations and politics -History of the negotiations - Goals and preamble -Targets human rights	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	D. Bodansky/J. Brunnée/L. Rajamani,International Climate Change Law, Oxford 2017, pp. 209-257; 296-313 UNEP Report, "Climate Change andHuman Rights" (2015) p. 1–10
37	6	**Eco²**	Instruments: Environmental Taxation	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Environmental taxation in the European Union: Are there common trends? lFrancisco J.Delgado JaumeFreireGonzález Maria J.Presno, 2022 Environmental taxation in Europe: What does it depend on? Castiglione et al., Cogent Economics & Finance (2014), 2: 967362http://dx.doi.org/10.1080/23322039.2014.967362
38	6	**Eco²**	Climate change impacts on Sectors: • Energy • Cities • Agriculture • Transport • Air quality	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	EU Climate and Energy Policy Beyond 2020: Are Additional Targets and Instruments for Renewables Economically Reasonable? Paul Lehmann, Erik Gawel, and Sebastian Strunz, 2019 Ingmar von Homeyer, Sebastian Oberthür & Andrew J. Jordan (2021) EU climate and energy governance in times of crisis: towards a new agenda, Journal of European Public Policy, 28:7, 959-979, DOI: 10.1080/13501763.2021.1918221
39	6	**Eco²**	Climate change impacts on Sectors: • Energy • Cities • Agriculture •	Interactive lectures, using PPT slides/class notes, digital	lecturing, discussion, problem solving.	EU Climate and Energy Policy Beyond 2020: Are Additional Targets and Instruments for Renewables Economically Reasonable?

			Transport • Air quality	pen.		Paul Lehmann, Erik Gawel, and Sebastian Strunz, 2019 Ingmar von Homeyer, Sebastian Oberthür & Andrew J. Jordan (2021) EU climate and energy governance in times of crisis: towards a new agenda, Journal of European Public Policy, 28:7, 959-979, DOI: 10.1080/13501763.2021.1918221
40	6	**Eco²**	EU Climate policy Challenges	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Matthias Weitzel, Toon Vandyck, Luis Rey Los Santos, Marie Tamba, Umed Temursho, Krzysztof Wojtowicz, A comprehensive socio-economic assessment of EU climate policy pathways, Ecological Economics, Volume 204, Part A, 2023, https://doi.org/10.1016/j.ecolecon.2022.107660.
41	6	**Eco²**	Reducing Carbon Emissions: Top-Down Approaches	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Climate Fix* Ch. 4,
42	6	**Eco²**	The Cost of Reducing Emissions	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	*Casino* Ch. 14 pp. 157–165, *Casino* Ch. 15
43	6	**Eco²**	Society and energy transition	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	Hainsch, Karlo & Löffler, Konstantin & Burandt, Thorsten & Auer, Hans & Crespo del Granado, Pedro & Pisciella, Paolo & Zwickl-Bernhard, Sebastian, 2022. "Energy transition scenarios: What policies, societal attitudes, and technology developments will realize the EU Green Deal?," Energy,

						Elsevier, vol. 239(PC).
44	6	**Eco²**	Private actors: social movements and corporations • Social movements • Carbon majors Corporate social responsibility	Interactive lectures, using PPT slides/class notes, digital pen.	lecturing, discussion, problem solving.	CDP Carbon Majors Report (2017) D.S. Olawuyi, 'Corporate Accountabilityfor the Natural Environment and Climate Change' in: Ilias Bantekas & Michael Ashley Stein (eds.), Business & Human Rights Law, Cambridge 2021,pp. 234–259 M. Scopelliti, Non-Governmental Actorsin International Climate Change Law, 1.ed., London 2021, pp. 7-29, 29-49
TBD			**Final Exam**		**Mark: 50%**	

1 Environmental Module (20 hrs) , 2 Economic Impacts Module (20 hours) , * Learning procedures: (Face-to-Face, synchronous, asynchronous), * * Teaching methods: (Lecture, video…..). ** * Reference: (Pages of the book, recorded lecture, video….).

Seventh: Assessment methods

Methods	OnlineLearning	Blended Learning	Face-To-Face Learning	Measurable Course (ILOs)
Mid Exam	0	0	20	
Essay	0	0	20	
Participation	0	0	10	
Asynchronous Activities	0	0	0	
Final Exam	0	0	50	

Eighth: Course Policies

- All course policies are applied on all teaching patterns (online, blended, and face-to-face Learning) as follows:

a. Punctuality.
b. Participation and interaction.
c. Attendance and exams.

- Academic integrity: (cheating and plagiarism are prohibited).

Approved by:	Name	Date	Signature
Head of Department			
Faculty Dean			