Advanced technologies for sustainable industries 4.0

Professor's name, university & email	Giovanni Di Noto, Klaipeda University (Lithuania) giovanni.di-noto@ku.lt
Sector	Smart
Thematic area	Industry 4.0
EQF level	Level 6 (Bachelor)
ISCED-F field	0688 - Inter-disciplinary programs and qualifications involving information and Communication Technologies
ESCO skills & competences	T1.2 – transversal skills and competences – core skills and competences – working with numbers and measures – carry out calculations - apply statistical analysis techniques S4.1.0 – skills – management skills – developing objectives and strategies - develop strategy to solve problems K0688 - knowledge – information and communication technologies (ICTS) - inter-disciplinary programmes and qualifications involving information and communication technologies (ICTS)
-Proposed dates of the classes	22/10, 29/10, 5/11, 12/11, 26/11, 14:00-16:00 (CET)
One hour for tutoring consultation	03/12, 14:00-15:00 (CET)
Date of the exam/ final assessment	07/01/2025, 14:00-15:00 (CET) time-limited quiz (Moodle) 21/01/2025, 23:59 (CET) deadline for individual project submission
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	This course elucidates themes related to industry 4.0. It explores production processes from a sustainability maximization perspective via smarter primary, secondary & tertiary sectors. It dives into topics such as SDG (Sustainable Development Goals), key Sustainability drivers, 3P (Planet, People, Profit), a.k.a. triple bottom-line, accounting, ESG regulations & mandatory scope 1,2,3 reporting, production assets usage & processes optimization, and related technologies (IoT, AI/ML, DLT, Quantum Computing use cases & best practices).
Description of the content (week by week)	**Lecture 1: Introduction to Smart Industry 4.0 & 3P accounting (2 hours)** • Class introductions, MC introduction, goals, structure, exam structure • Industry 4.0 overview, history (from 1.0 to 4.0) background & context

- Key concepts, technologies, models, glocalization vs. globalization
- Smart Industry 4.0 & ESG drivers of Sustainability
- SFRD, CSRD, CSDDD, CBAM, TCFD, SASB
- 3P (Planet, People, Profit) accounting

Self-Learning (1.5 hours): research & read about history & impact of industrial & agricultural revolutions, case studies on successful integrations of Industry 4.0, Industry 4.0 implementation methodologies, ESG reporting legislations & scopes, 3P accounting systems

Lecture 2: Smart Primary Sector (2 hours)

- Permaculture, vertical farming & conventional agriculture landscapes
- IoT, AI/ML, and other technologies in agriculture, fisheries & forestry
- Conservation, regeneration & socially driven sustainability models
- Sustainable practices overview in Mining

Self-Learning (1.5 hours) research & read about precision agriculture, vertical farming, and smart mining, emerging technologies in primary sectors.

Lecture 3: Smart Secondary Sector (2 hours)

- Circular vs. Linear economics, impact on product design & production
- Energy efficiency, waste reduction, resource & logistics optimization
- IoT, AI/ML, robotics & 3/4D printing & other smart technologies
- Predictive maintenance & asset lifecycle management
- 3/4/5PL business models & best practices

Self-Learning (1.5 hours) research & read about manufacturing 4.0 real-world case implementations, 3/4/5PL model use cases for key sectors

Lecture 4: Smart Tertiary Sector (2 hours)

- Digital twins, AI/ML, IoT in service sectors such as healthcare, finance, etc.
- Case studies on sustainable practices in service industries

Self-Learning (1.5 hours) case studies on smart services & technology trends

Lecture 5: Anticipating challenges with advanced techs (2 hours)

- Challenges with AI/ML, DLT, IoT/E, Quantum & Bio Computing

Self-Learning & exam preparation (9 hours) general revision & preparation for knowledge assessment exam, individual project preparation & submission.

Importance for society	This inter-disciplinary course educates and prepares students to meaningfully contribute to society's most pressing challenges via the application of advanced technologies, across primary, secondary & tertiary industries & a variety of sectors. The course promotes innovation, sustainable economic models, environmental stewardship, social resilience, all of which aligned with critical SDGs for the future.
Skills (hard and soft skills)	**Hard skills:** • Real-world & synthetic data analysis, scrutiny & interpretation • Lifecycle & Environmental Impact Assessment in ESG scope 1,2,3 contexts **Soft skills:** • Critical Thinking & Problem Solving • Collaboration & Communication
Sustainable Development Goals	SDG9. Industry, innovation and infrastructure SDG11. Sustainable cities and communities SDG12. Responsible consumption and production

Learning outcomes	Study methods	Assessment methods	Assignments. Requirements/format	Supervision and identity verification during assessment
Define industry 4.0 strategies aimed to enhance positive sustainability outcomes.	Lectures, Group discussions, Individual research, Individual project work.	Online quiz Individual project	Submission for individual projects in the form of a recorded video in Pecha-Kucha format (20 slides, 20 seconds per slide) on a relevant topic, such as analysis real-world industry 4.0 case analysis, or solution to sustainability challenge via industry 4.0 application Presentations scored on 1) Use case or proposed solution's sustainability strengths, 2) Visual communication skills, 3) overall clarity & articulation	electronically unsupervised online (Moodle), time-limited with login-based identity verification. Individual project: unsupervised, with identity verification (live recorded presentation)
Apply the acquired knowledge to fulfill ESG reporting.	Lectures, Individual research.	Online Quiz	30-questions time-limited online Quiz	electronically unsupervised online (Moodle), time-limited with login-based identity verification.

Bibliography

Books:

1. Walker J, Pekmezovic A, Walker G, 2019 "*Sustainable Development Goals: Harnessing Business to Achieve the SDGs through Finance, Technology and Law Reform*"
2. Gilchrist A, 2016 "*Industry 4.0: The Industrial Internet of Things*"
3. Asthana R, 2015 "*Green and Sustainable Manufacturing of Advanced Material*"

Publications/articles:

1. Grieves M, Vickers J, 2016 " *Origins of the Digital Twin Concept*" https://www.researchgate.net/publication/307509727_Origins_of_the_Digital_Twin_Concept
2. Kirchherr J, Reike D, Hekkert M, 2017 "*Conceptualizing the circular economy: An analysis of 114 definitions*" https://www.sciencedirect.com/science/article/pii/S0921344917302835
3. Mir SM, Naikoo NB, Kanth RH, Bahar FA, Bhat MA, Nazir A, Mahdi AS, Amin Z, Singh L, Raja W, Saad AA, Bhat TA, Palmo T, Ahngar TA, 2022 "*Vertical Farming: The future of agriculture A Review*" https://www.thepharmajournal.com/archives/2022/vol11issue2S/PartP/S-11-2-22-988.pdf

Websites:

1. United Nations Sustainable Development Goals https://sdgs.un.org/goals
2. World Economic Forum (WEF) - Industry 4.0 https://www.weforum.org/focus/fourth-industrial-revolution/
3. International Institute for Sustainable Development (IISD) https://www.iisd.org/
4. Sustainability Accounting Standards Board (SASB) https://www.sasb.org/
5. Ellen MacArthur Foundation - Circular Economy https://www.ellenmacarthurfoundation.org/

Cybersecurity for Smart Ports & Maritime Industries

Professor's name, university & email	Giovanni Di Noto, Klaipeda University (Lithuania) giovanni.di-noto@ku.lt
Sector	Coastal
Thematic area	Smart Ports
EQF level	Level 6 (Bachelor)
ISCED-F field	0688 - Inter-disciplinary programs and qualifications involving information and Communication Technologies
ESCO skills & competences	T4.5 – transversal skills and competences – social and communication skills and competences - following ethical code of conduct S5.2.2 - skills – working with computers – setting up and protecting computer systems – protecting ICT devices – implement ICT security policies K1031 - knowledge – services – security services – military and defence – cyber security
-Proposed dates of the classes	28/11, 5/12, 12/12, 19/12, 9/01, 14:00-16:00 (CET)
One hour for tutoring consultation	10/01, 14:00-15:00 (CET)
Date of the exam/ final assessment	14/01/2025, 14:00-15:00 (CET) time-limited quiz (Moodle) 17/01/2025, 23:59 (CET) deadline for individual project submission
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	This course builds the skills and knowledge required to enhance ports' smartness with tools and methods tailored to the unique cybersecurity challenges impacting ports and maritime industries. It explores cybersecurity themes across all informational layers from their outer dimensions (CTI ecosystems, cloud infrastructure, public networks, on-ship & cargo security, port connected operational systems & IoT fleet) to inner ones (authentication, identity management, application, data, AI/ML security, future challenges with quantum computing) considering both threat & prevention/mitigation strategies and how to implement them.
Description of the content (week by week)	**Lecture 1: Introduction to cybersecurity discipline (2 hours)** • Class introductions, MC introduction, goals, structure, exam structure • Ethical vs non-ethical hacking, red vs blue, black/white box methods • Cybersecurity landscape, historical background & post-2021 context

- GRC (Governance, Risk & Compliance), Learning organizations
- ISO-31000, ISO-27001 & tooling overview

Self-Learning (1.5 hours): research & read about cybersecurity use cases in port & maritime industries, root causes, impact, mitigation, prevention, GRC frameworks such as ISO-27001, ISO-31000, cybersecurity legislation including port specific.

Lecture 2: Cybersecurity outer, network & endpoint layers (2 hours)

- CTI networks, protocols, ecosystems (STIX/TAXII, CVE, OWASP, NIST), cloud infrastructure LEO satellite networks, mono vs multi-vendor supply chain, CDN (Content Delivery Networks), technical & legal cyber-hunting
- Physical security, DDoS, network gateways, firewalls, DNS, metal/virtual server, SOE, encryption, certificates, DRM, drills, endpoint IoT, stolen assets
- Port & maritime assets exposure, jamming devices, trojan cargoes, other network layer mitigative strategies

Self-Learning (1.5 hours) research & use outer layers cybersecurity tools, study attack techniques over networks, servers & endpoints, and how to prevent them.

Lecture 3: Cybersecurity authentication & architectural layers (2 hours)

- Identity management, MFA users & IoT, Network level privileges & permissions, information security policies, segregation of duties, 0-Trust, audit logs, reconnaissance techniques, sniffing, social engineering, threat avoidance tools
- Software quality assurance, SBOM, findings evaluation, ranking & prioritization
- Security & Privacy By-Design software architecture & development principles

Self-Learning (1.5 hours) research & read about SOX principles, automated testing tools, secure-by-design software architecture

Lecture 4: Cybersecurity inner app & data layers (2 hours)

- Common app threat types, classification, ranking, app configuration risks, app threats & related mitigation/prevention (code reviews, 3P libraries audits, featuritis neutralization, vulnerability & penetration testing)
- Data classification, SQL injection types, AI/ML threats & other data-related attacks, data leakages & their mitigation/prevention such as with DLT
- Challenges with AI/ML, DLT, IoT/E, & Quantum Computing (data encryption)

Self-Learning (5.5 hours) practical cyber war games (red & blue teams)

Lecture 5: Cybersecurity change management & implementation (2 hours)

- Change management & cybersecurity implementation strategies, green fields/environments vs established organization
- Cybersecurity inspections/assessments, forensics/reports
- Cybersecurity radar, cybersecurity awareness and training

Self-Learning & exam preparation (5 hours) general revision & preparation for knowledge assessment exam, individual project preparation & submission.

Importance for society	This course educates and prepares students to become professionals that will advance cybersecure digitalization for sustainable smart ports and maritime industries. The maritime industry is responsible for the transportation of over 90% of global trade. It faces an increasing risk surface and has become a de facto target for cyber criminals.
Skills (hard and soft skills)	**Hard skills:** • Advanced cybersecurity ethical hacking, threat identification & classification • Preventative & mitigative techniques, incident response **Soft skills:** • Ethics, Good Governance & Risk Management • Planning, Critical Thinking, Communication & Change Management
Sustainable Development Goals	SDG9. Industry, innovation and infrastructure SDG11. Sustainable cities and communities

Learning outcomes	Study methods	Assessment methods	Assignments. Requirements/format	Supervision and identity verification during assessment
Setup cyber security strategies for port & maritime operations.	Lectures, Group discussions, Individual research, Individual project work.	Online quiz Individual project	Submission for individual projects in the form of a recorded video in Pecha-Kucha format (20 slides, 20 seconds per slide) on a relevant topic, such as real-world port-related cyber-attack case analysis, or cybersecurity solution. Presentations scored on 1) Use case or proposed solution's cybersecurity strengths, 2) Visual communication skills, 3) overall clarity & articulation	electronically unsupervised online (Moodle), time-limited with login-based identity verification. Individual project: unsupervised, with identity verification (live recorded presentation)
Manage cyber threats & incidents.	Lectures, Individual research.	Online Quiz	30-questions time-limited online Quiz	electronically unsupervised online (Moodle), time-limited with login-based identity verification.

Bibliography	**Books:** 1. Rashid, Chivers, Danezis, Lupu, Martin,2019, "*Cyber Security Body of Knowledge*" 2. Mark E. Goldstein, 2019 "*Port Cybersecurity: Securing Critical Infrastructure*" 3. Todd E, Williamson P, 2020, "*Cybersecurity in the Maritime Domain*"

System thinking and system dynamics modelling

Professor's name, university & email	Vitalij Denisov, Klaipeda University (Lithuania) vitalij.denisov@ku.lt
Sector	Smart
Thematic area	Digital humanities
EQF level	Level 6 (Bachelor)
ISCED-F field	0688 - Inter-disciplinary programs and qualifications involving information and Communication Technologies
ESCO skills & competences	T2.1 – transversal skills and competences – thinking skills and competences - processing information, ideas and concepts S2.7.0 – skills – information skills - analysing and evaluating information and data S5.6.0 – skills – working with computers – using digital tools for collaboration, content creation and problem solving K0688 – knowledge – information and communication technologies (ICTS) - inter-disciplinary programmes and qualifications involving information and communication technologies (ICTS)
Proposed dates of the classes	22/11, 29/11, 06/12, 13/12, 20/12, 14:00-16:00 (CET)
One hour for tutoring consulations	19/12, 16:00-17:00 (CET)
Date of the exam/ final assessment	19/12, 23:59 (CET) deadline for portfolio submission (collection of models in Moodle) 20/12, 15:00-16:00 (CET), time-limited quiz (Moodle)
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	This micro-credential aims to develop intuition for systems thinking and more formal skills in modeling systems dynamics. It enables students to define a problem and formulate the system under study, as well as to develop their own computer models of system dynamics for various phenomena and processes in various fields of knowledge and application areas. When applied in the humanities and social sciences, the course also aims to bridge the gap between the descriptive approach used in the social sciences and the formal approach typically used in the natural sciences. Being proposed as an approach for managing complexity, the systems thinking provides a tool to help analysts, policy and decision makers understand the cause-and-effect relationships among data, information, and people, i.e., the main

	constitutes of the modern knowledge-based society. It, therefore, improves individual and collective decision making by focusing attention on the causes of problems and potential changes needed to produce better results. Also, system dynamics approach helps linking the knowledge that students have already acquired while studying different disciplines.
Description of the content (week by week)	Unit 1. Concept of a system, systems and models (2 hours: lecture): – System approach. Definition of a system. System analysis principles. Systems thinking and system dynamics approach. – From systems to their models. Model types, mathematical and simulation models. Dynamic models. – Model development procedure and techniques. Causal loops and stock and flow diagramming methods. Unit 2. Model design in a simulation system (2 hours: lecture and practical work) – Modeling systems (simulators). – Model design in a simulation system using stock and flow diagrams. – Running created models (model simulation). Unit 3. Models of growth and decline (2 hours: lecture and practical work) – Growth laws. Formulation of assumptions of growth models. – Numerical implementation of models. Unit 4. More complex models: (2 hours: lecture and practical work). – Models of interactions. Different types of interactions: predator-prey, competition, etc. – Presentation of modelling results. Phase portrait of a system. Unit 5. Spread and diffusion models (2 hours: lecture and practical work). – Epidemic models. Innovation and product diffusion models. – Summary of the course, duscussion and model portfolio formation.
Importance for society	Rapid changes in all spheres of our lives complicate the world. As recent WEF reports highlight, megatrends such as the emergence of a global economy, rapid urbanization, technological breakthroughs, climate change, and resource scarcity are shaping a whole new set of global risks for which our society must be better prepared. Systems thinking is often referred to as the “cognitive skill of the 21st century” because it is important to learn a new way of thinking about this ever-changing, increasingly complex world and equip students with the analysis and modeling skills they need to succeed in their future lives.
Skills (hard and soft skills)	Hard skills: – System dynamics diagramming methods – Design & application of simulation models Soft skills: – Creative & critical thinking – Problem solving
Sustainable Development Goals	SDG4: Quality education SDG8: Decent work and economic growth SDG11: Sustainable cities and communities SDG12: Responsible consumption and production

Learning outcomes	Study methods	Assessment methods	Assignments. Requirements/format	Supervision and identity verification during assessment
Demonstrate fresh knowledge of systems analysis principles and deep under-standing of the system dynamics approach and its application to the development of conceptual and simulation models	Lectures, discussions	Online Quiz	Time-limited quiz in the virtual learning environment Moodle: 10-questions of different type	Supervised online with login-based identity in Moodle
Prepare new & apply existing computer-based simulation models using stock and flow and causal loop diagrams in a simulation system	Presentations, diagramming, simulation of real-life situations, problem-based learning	Portfolio	Individual work. Submission of portfolio in Moodle in the form of individually developed system dynamics models in a chosen simulation system	Unsupervised online submission of portfolio in Moodle with login-based identity verification

Bibliography

Books:

1. Meadows, D. Thinking in systems. A Primer. Edited by D. Wright, Sustainability Institute. Earthscan: London. 2009. 218 p. ISBN: 978-1-84407-726-7
2. Bossel, H. Systems and Models: Complexity, Dynamics, Evolution, Sustainability. Norderstedt, Germany: BoD - Books on Demand, 2007. ISBN 9783833481215.
3. Borshchev, A. The Big Book of Simulation Modeling: Multimethod Modeling with Anylogic 6. AnyLogic North America, 2013, 614 p.
4. Grigoryev, I. AnyLogic 8 in Three Days. A quick course in simulation modeling. Fifth edition, 2023. 252 p.

Publications/articles:

1. Sarah York, Rea Lavi, Yehudit Judy Dori, and MaryKay Orgill. Applications of Systems Thinking in STEM Education. // J. Chem. Educ. 2019, 96, 12, p. 2742–2751. https://doi.org/10.1021/acs.jchemed.9b00261
2. Sakalauskas L, Denisov V, Dirzyte A. Hybrid Modeling of Anxiety Propagation in Response to Threat Stimuli Flow. // Mathematics. 2023; 11(19):4121. https://doi.org/10.3390/math11194121
3. A system dynamics glossary. Compiled by David N. Ford. // Syst. Dyn. Rev. 35, 369–379 (2019). https://doi.org/10.1002/sdr.1641

Websites:

	1. The System Thinker. System Thinking: What, Why, When, Where, and How? By Michael Goodman. https://thesystemsthinker.com/systems-thinking-what-why-when-where-and-how/ 2. Systems thinking: https://en.wikipedia.org/wiki/Systems_thinking 3. What is System Dynamics? https://www.uib.no/en/rg/dynamics/39282/what-system-dynamics 4. Stella Online. Powerful modeling and diagramming capabilities in any web browser: https://www.iseesystems.com/store/products/stella-online.aspx 5. AnyLogic: Simulation Modeling Software Tools and Solutions. https://www.anylogic.com/ 6. AnyLogic Personal Learning Edition (PLE) download: https://www.anylogic.com/s/download-free-simulation-software-for-education/

English Communication for Sustainable Development

Professor's name, university & email	Arash Javadinejad, Catholic University of Valencia (Spain) arash.javadinejad@ucv.es
Sector	Sustainability
Thematic area	English for Sustainability
EQF level	Level 6 (Bachelor)
ISCED-F field	0231 Language acquisition
ESCO skills & competences	T1.1 - Transversal skills and competences- core skills and competences- mastering languages - academic English L1 - Language skills and knowledge – languages – English - academic English K0231 - Knowledge - Knowledge arts and humanities – languages - language acquisition - academic English
Proposed dates of the classes	19/11, 26/11, 03/12, 10/12, 17/12, 12:00-14:00 (CET)
One hour for tutoring consulations	10/12, 11:00-12:00 (CET)
Date of the exam/ final assessment	17/12, 12:00-14:00 (CET)
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	English Communication for Sustainable Development is an advanced level course to improve your English skills related to the thematics of Sustainable Development Goals (United Nations, 2015). High-standard material is taught through a blend of online-autonomous lessons and activities, accompanied by a tutor for support. In this course, the student will learn and practice dealing with authentic material and topics related to Sustainability; the course will help sharpen his/her edge in terms of the receptive (reading and listening) and productive (speaking and writing) skills.
Description of the content (week by week)	Unit 1. Social Aspects of Sustainability (2 hours) Unit 2. Sustainability, Economy and Inequality (2 hours) Unit 3. Sustainability and Environment (2 hours) Unit 4. International Cooperation and Sustainability (2 hours) Unit 5. Conclusion and Evaluation (2 hours)

Importance for society	The course "English Communication for Sustainable Development " is significant for society as it integrates language learning with critical environmental issues, fostering global awareness and communication skills essential for addressing sustainability challenges. By focusing on Sustainability, the course raises awareness about the interconnectedness of environmental, social, and economic systems, emphasizing the importance of sustainable practices for the well-being of future generations. It encourages students to think critically about environmental impacts, promotes sustainable living habits, and equips them with the vocabulary and communication tools needed to engage in meaningful discussions and advocacy for sustainable development. This kind of education is vital in cultivating informed and proactive global citizens committed to preserving the planet.
Skills (hard and soft skills)	Hard skills: • Grammar and vocabulary proficiency in the area of Sustainability, • Technichal communication (written and spoken). Soft skills: • Critical Thinking: Through exploring sustainability challenges, students will develop the ability to analyze problems, evaluate solutions, and think critically about the implications of various actions on the environment and society. • Effective Communication: The course emphasizes the importance of conveying ideas clearly and persuasively, both in written and spoken forms, fostering the ability to engage diverse audiences in discussions about sustainability issues and initiatives.
Sustainable Development Goals	All 17 Sustainable Development Goals are covered during the course, so that the student is able to use specific vocabulary after the course.

Learning outcomes	Study methods	Assessment methods	Assignments. Requirements/format	Supervision and identity verification during assessment
Find necessary linguistic resources related to Sustainability	Presentations Lectures Group Work Individual Work Homework (Tasks)	Continuous assessment: Portfolio of activities, projects and tasks Evaluation of assignments Collected evidence from formal and informal learning	Group work, Individual work, and tasks Requirements: Individual work Work in pairs Presentation in front of colleagues Written tasks (essay)	supervised online or onsite with identity verification

Discuss issues related to Sustainability in written and spoken discourse		Class observation and participation Quizzes on the platform		
Bibliography	**Books:** 1. Cambridge Complete First, Cambridge University Press & Assessment 2. Cambridge Complete Advanced, Cambridge University Press & Assessment 3. Cambridge Compact First, Cambridge University Press & Assessment 4. Cambridge Compact Advanced, Cambridge University Press & Assessment **Websites:** https://sdgs.un.org/goals			

"Engagement, Inclusion, and Social Transfer: Perspectives from the Field of Entrepreneurship"

Professor's name, university & email	Daniel Ordiñana-Bellver, Catholic University of Valencia (Spain) daniel.ordinana@ucv.es
Sector	European
Thematic area	Equitable and inclusive civic management
EQF level	Level 6 (Bachelor)
ISCED-F field	0188 Inter-disciplinary programmes and qualifications involving education
ESCO skills & competences	T4.2 – transversal skills and competences - social and communication skills and competences – supporting others (advise others; show empathy) T6.3 – transversal skills and competences – life skills and competences – applying civic skills and competences (value rights and responsibilities, respect the diversity of cultural values and norms) K018 – knowledge - education - inter-disciplinary programmes and qualifications involving education) S1.9 – skills - communication, collaboration and creativity – solving problems
Proposed dates of the classes	23/10, 30/10, 6/11, 13/11, 20/11, 15:00-17:00 (CET)
One hour for tutoring consulations	19/11, 11:00-12:00 (CET)
Date of the exam/ final assessment	20/11, 15:00-17:00 (CET) Final presentations
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	"Engagement, Inclusion, and Social Transfer" is a micro-credential course designed for students from diverse backgrounds and faculties. The course aims to enhance students' understanding and skills in fostering inclusive environments and facilitating social integration. Participants will explore strategies to engage effectively with diverse communities and promote equitable social change. The final product of the course will be the creation of a company with social and civic purposes, in which the background of the different creative members will be its identity mark. Its presentation, in front of the rest of the classmates, will be the evaluation test that will determine whether or not the course has been passed.

Description of the content (week by week)	Some of the contents (such as those related to social and sustainable entrepreneurship) are taught at the same time as the rest given their continuous relationship and exemplification. Unit 1. Presentation, background, disability and risk of social exclusion (2h) Unit 2. Social and sustainable entrepreneurship from a specific field (2h) Unit 3. Designing a social and sustainable group enterprise: roles, objectives and preliminary analysis (2h) Unit 4. Critical analysis of an inclusive proposal: points of interest and suggestions for improvement (2h) Unit 5. Final presentations (2h)
Importance for society	The European Union has made considerable efforts to encourage young students to become socially and sustainable entrepreneurs. In line with the guidelines of the 2030 Agenda, entrepreneurship from this perspective provides value and progress regardless of the field in which these predispositions are materialised. Young people should at least know that entrepreneurship is possible in any field, as long as they have the appropriate training to do so.
Skills (hard and soft skills)	Hard skills: researching Soft skills: leadership, communication, creativity
Sustainable Development Goals	SDG3. Good health and well-being SDG4. Quality education SDG8. Decent work and economic growth SDG9. Industry, innovation and infrastructure SDG10. Reduced inequalities SDG11. Sustainable cities and communities SDG12. Responsible consumption and production SDG16. Peace, justice and strong institutions SDG17. Partnerships for the goals

Learning outcomes	Study methods	Assessment methods	Assignments. Requirements/format	Supervision and identity verification during assessment
Demonstrate theorical and practical knowledge about social, civic engagement and apply it in the entrepreneurship	Master class. Video. Discussion	Project	Individual/cooperative work	Supervised with no identity verification

Design a social and sustainable company	Interactive methodologies/ group methodologies (eg: Aronson's puzzle)	Group Work/ Project/ Final Presentation	Group work, Presentation in front of the colleagues	Supervised online with identity verification

Bibliography

Publications/articles:

1. van Lunenburg, M., Geuijen, K. & Meijer, A. How and Why Do Social and Sustainable Initiatives Scale? A Systematic Review of the Literature on Social Entrepreneurship and Grassroots Innovation. Voluntas 31, 1013–1024 (2020). https://doi.org/10.1007/s11266-020-00208-7
2. González-Serrano, M.H.; Añó Sanz, V.; González-García, R.J. Sustainable Sport Entrepreneurship and Innovation: A Bibliometric Analysis of This Emerging Field of Research. Sustainability 2020, 12, 5209. https://doi.org/10.3390/su12125209
3. Ordiñana-Bellver, D., Pérez-Campos, C., González-Serrano, MH., Martínez-Rico, G. Towards the development of future sustainable sports entrepreneurs: An asymmetric approach of the sports sciences sustainable entrepreneurial intentions, *Journal of Hospitality, Leisure, Sport & Tourism Education*, 31, https://doi.org/10.1016/j.jhlste.2022.100403.
4. Ordiñana-Bellver, D., Aguado-Berenguer, S., Pérez-Campos, C., González-Serrano, MH. Exploring nature-based physical activity as a catalyst for sustainable entrepreneurial intentions in sport science students, *Journal of Hospitality, Leisure, Sport & Tourism Education*, 34, 100482, https://doi.org/10.1016/j.jhlste.2024.100482.

Websites:

1. https://www.un.org/sustainabledevelopment/es/2015/09/la-asamblea-general-adopta-la-agenda-2030-para-el-desarrollo-sostenible/
2. https://joint-research-centre.ec.europa.eu/entrecomp-entrepreneurship-competence-framework_en
3. https://www.ucv.es/campus-capacitas

Environmental literature

Professor's name, university & email	Mirna Sindičić, University of Zadar (Croatia) msindici@unizd.hr
Sector	University
Thematic area	Environmental and science education
EQF level	Level 6 (Bachelor)
ISCED-F field	0232 Literature and linguistics
ESCO skills & competences	S1.3.1 – Skills – communication, collaboration and creativity – teaching and training – teaching adacemic or vocational subjects – teach principles of literature K0232 – Knowledge – arts and humanities – languages - literature and linguistics – literary theory K0314 – Knowledge – social sciences, journalism and information – social and behavioural sciences - sociology and cultural studies
Proposed dates of the classes	12/12, 19/12, 9/01, 16/01, 23/01, 14:00-16:00 (CET)
One hour for tutoring consulations	27/01, (10:00-11:00 CET)
Date of the exam/ final assessment	30/1, (10:00-11:00 CET)
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	Environmental humanities are among the most dynamic subfields in literary and cultural studies today. This course on environmental literature, situated within the framework of environmental humanities, provides guidance in reading and analyzing climate fiction and environmental literature. Through the study of selected fictional texts, students will explore nature/society dualisms and the relationship between humans and the natural environment. Reading literature offers numerous benefits beyond entertainment and personal growth. It enriches vocabulary, develops empathy, enhances communication skills, and fosters analytical and critical thinking. Importantly, it also raises awareness of climate change and underscores the need for a more sustainable way of living. The aim of this course is to examine why literary fiction matters in the context of climate change discussions, investigate how literary and cultural forms shape perceptions of and relationships with the environment, and understand how writers express their environmental concerns within broader debates on climate change. Ultimately, the course seeks to demonstrate how fictional texts can

	raise awareness about climate change and suggest new ways of thinking about this critical issue.
Description of the content (week by week)	Unit 1. Course introduction. What are the Environmental humanities? What is the Anthropocene? Responding to the Environmental crisis (2 hours) Unit 2. Literature and the Anthropocene. Ecocriticism and Ecopoetics. Does Climate fiction make a difference? (2 hours) Unit 3. Early ecological fiction and Nature Writing. (2 hours) Unit 4. Climate change and 20th and 21st Century Literature. (2 hours) Unit 5. Imagining extinction. Concluding remarks. (2 hours)
Importance for society	• Increases awareness on environmental issues. • Humanizes climates change and provokes empathy. • Provokes ethical reflections and critical thinking about environment, ecology, climate change and sustainability. • Inspires action and change.
Skills (hard and soft skills)	Hard skills: Writing skills, Communication skills Soft skills: Analytical & Critical thinking, Active listening
Sustainable Development Goals	SDG4. Quality education SDG5. Gender quality SDG10. Reduced inequalities SDG11. Sustainable cities and communities SDG12. Responsible consumption and production SDG13. Climate action SDG17. Partnerships for the goals

Learning outcomes	Study methods	Assessment methods	Assignments. Requirements/format	Supervision and identity verification during assessment
Analyse the assigned environmental literature	Lecture and discussion	Presentation prepared by student	Individual work on final essay	Supervised online
Interpret literary and cultural texts within wider debates and discourses on environment and climate change	Case studies	Evaluation of assignment	Attendance and class participation	Supervised online

Bibliography	

Books:

1. Jean Giono, *The Man who Planted Trees*
2. Paolo Cognetti, *The Eight Mountains*
3. J. G. Ballard, *The Drowned World*
4. Maja Lunde, *The History of bees*

Publications/articles:

1. Clark, Timothy (2011), *The Cambridge Introduction to Literature and the Environment*, Cambridge University Press.
2. Emmet, R. S., Nye, D. E. (2017), *The Environmental Humanities. A Critical Introduction,* The MIT Press
3. Parham, John (ed.) (2021), *The Cambridge Companion to Literature and the Anthropocene,* Cambridge University Press.

Websites:

1. https://climateimagination.asu.edu/everything-change/
2. https://www.dailymotion.com/video/xw69i5
3. https://www.imdb.com/title/tt14641542/

Introduction to film literacy and filmmaking

Professor's name, university & email	Mirko Duić, University of Zadar (Croatia) miduic@unizd.hr
Sector	Smart
Thematic area	Digital marketing and communication
EQF level	Level 6 (Bachelor)
ISCED-F field	0211 Audio-visual techniques and media production
ESCO skills & competences	K0211 – Knowledge – arts and humanities – arts - audio-visual techniques and media production (film and video production) S1.12.0 – Skills – Communication, collaboration and creativity - creating artistic, visual or instructive materials T4.1 – Transversal skills and competences – social and communication skills and competences - communicating (address an audience; promote ideas, products, services)
Proposed dates of the classes	21/11, 28/11, 12/12, 19/12, 23/01, 12:00-14:00 (CET)
One hour for tutoring consulations	09/01, 12:00-13:00 (CET)
Date of the exam/ final assessment	23/01, 12:00-14:00 (CET)
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	Nowadays, private and public communication and digital marketing have largely been based on the creation, sharing and viewing of films. This micro-credential course, will support students in learning about elements of film literacy. It will support them in learning about basic principles, methods and technologies needed for the creation of films. When the film authors are well acquainted with the important film literacy concepts, the more creative and effective they could be in developing, using and combining those concepts to create films with a high educational level, convincing and entertaining films. The goal of this course is to support the students to acquire the foundational prerequisites necessary for making different types of films that could bring benefits to particular viewers and the whole society.
Description of the content (week by week)	Unit 1. Introduction and film aesthetics (1 hour); Film editing 1 (1 hour) Unit 2. Diversity and characteristics of film types (0.5 hour); Film editing 2 (1.5 hour)

	Unit 3. Finding and shaping ideas for film creation (0.5 hour); Film editing 3 (1.5 hour) Unit 4. Film shooting, camera elements & lighting (1 hour); Film editing 4 (1 hour) Unit 5. Filmmaking tools and platforms (1 hour); Exam (1 hour)
Importance for society	The importance of all forms of communication is invaluable for the good functioning of society. Whether it is oral, written, audio-visual or some other type of communication. Nowadays, communication through different types of films - documentary, feature, animated, or films that combine these genres - is present in different ways in everyday life. We can single out just one of many examples - film tutorials on the use of computer programs, which are available on video portals like YouTube. These film tutorials are watched by millions of people around the world on a daily basis. They are a specific type of educational films that are very useful from a societal point of view because they enable people and many societies around the world to expand their knowledge, skills and competencies related to the topics that interest them.
Skills (hard and soft skills)	Hard skills: Basic film shooting & editing skills Soft skills: Problem solving & Creativity
Sustainable Development Goals	All 17 Sustainable Development Goals of the UN could be described and explained in detail, as well as convincingly advocated and promoted with various types of films.

Learning outcomes	Study methods	Assessment methods	Assignments. Requirements/format	Supervision and identity verification during assessment
Perform shooting and editing of films at the basic level	Lectures, individual activities, discussions	Evaluation of assignments	Individual work including the creation of short film on the chosen topic Requirements: filmmaking activities	Unsupervised with no identity verification
Demonstrate an understanding of the basic principles, methods and technologies used in the filmmaking.	Lectures, individual activities, discussions	Attendance, evaluation of assignments, oral exam	Individual work Requirements: filmmaking activities, presentation in front of the colleagues	Unsupervised with no identity verification (assignments); supervised with identity verification (oral exam)

Bibliography	**Books:** 1. Reich, John. (2017) *Exploring Movie Construction & Production: What's So Exciting about Movies?*. Open SUNY Textbooks. URL: https://ecampusontario.pressbooks.pub/movieconstruction/

2. Moss, Yelizaveta; Wilson, Candice. *Film Appreciation*. University of North Georgia, Affordable Learning Georgia. URL: https://alg.manifoldapp.org/projects/film-appreciation
3. Sharman, Russell. (2020) *Moving pictures: An introduction to cinema*. University of Arkansas. URL: https://uark.pressbooks.pub/movingpictures/

Publications/articles:

1. Martín Moro, Ruth; García Prieto, Álvaro, et al. (2022). *WAAT Guide for Educators*. URL: https://waatproject.eu/guide
2. Blanco, Xiomara. (2023) *Museums and YouTube: You'll never believe these 3 tips to improve your channel*. American Alliance of Museums. URL: https://www.aam-us.org/2023/05/05/museums-and-youtube-youll-never-believe-these-3-tips-to-improve-your-channel/
3. Robbins, Emily. (2015) *Art Museums and YouTube: Current Practice and Potential Strategy*. MW2015: Museums and the Web. URL: https://mw2015.museumsandtheweb.com/paper/art-museums-and-youtube-current-practice-and-potential-strategy/index.html
4. Zeman, Jarrett. *16 Tips for Creating a Small Museum YouTube Series*. American Association for State and Local History. URL: https://aaslh.org/16-youtube-tips/

Coastal Business Strategies and Legislation

Professor's name, university & email	Andreea Condurache, Technical University of Civil Engineering in Bucharest (Romania) andreea.condurache@utcb.ro
Sector	Coastal
Thematic area	Business in coastal areas
EQF level	Level 6 (Bachelor)
ISCED-F field	0488 Interdisciplinary programs and qualifications involving business, administration and law
ESCO skills & competences	K040 – knowledge - business, administration and law – business, administration and law not further defined K048 – knowledge – business, administration and law – interdisciplinary programs and qualifications involving business, administration and law
Proposed dates of the classes	19/11, 26/11, 03/12, 10/12, 17/12, 12:00-14:00 (CET)
One hour for tutoring consultations	10/12, 14:00-15:00 (CET)
Date of the exam/ final assessment	17/12, 13:00-14:00 (CET)
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	A course that will introduce studies in an interdisciplinary field of business, administration and law in coastal areas. The purpose of the course is the acquisition of skills in: - identifying business opportunities in coastal areas and implementing business adaptation plans to the economic and social environment adapted to the development strategies promoted at the EU level.
Description of the content (week by week)	Unit 1. Business opportunity in coastal areas (2 hours) Unit 2. International Commerce in coastal areas (2 hours) Unit 3. Economic, social and territorial cohesion (2 hours) Unit 4. Human resources in business (2 hours) Unit 5. Business strategy (2 hours)

Importance for society	Businesses are the backbone of economic growth, driving various economic activities that sustain national and global economies. Businesses in coastal areas can contribute to the prosperity of a local nation by producing and selling goods and services, leading to increased income, employment, and improved living standards.			
Skills (hard and soft skills)	Hard skills: knowledge and abilities needed to do business in coastal areas Soft skills: Critical and creative thinking, collaboration			
Sustainable Development Goals	SDG1. No poverty SDG2. Zero hunger SDG3. Good health and well-being SDG4. Quality education SDG8. Decent work and economic growth SDG9. Industry, innovation and infrastructure SDG11. Sustainable cities and communities SDG12. Responsible consumption and production SDG14. Life below water SDG17. Partnerships for the goals			
Learning outcomes	**Study methods**	**Assessment methods**	**Assignments. Requirements/format**	**Supervision and identity verification during assessment**
Analyze coastal business contexts and develop sustainable business strategies to safeguard cultural heritage	Lecture, discussions, group work	Quiz	Group work	Lecture, discussions, group work
Identify business opportunities in coastal areas	Lecture, discussions, individual work	Written assessment	Individual work	Lecture, discussions, individual work
Bibliography	**Books:** 1. Integrated Coastal Management, Martin Le Tissier, Dik Roth, Maarten Bavinck, Leontine Visser **Publications/articles:** 1. Opportunities for transforming coastal and marine tourism, coordinating lead author Eliza Northrop			

	2. Coastal Development: Resilience, Restoration and Infrastructure Requirements **Websites:** 1. https://medium.com 2. https://www.coastmagazine.co.uk 3. https://www.coastalbusiness.com

Durable, Sustainable, Resilient?

Professor's name, university & email	Alexandru Aldea, Florin Pavel, Technical University of Civil Engineering Bucharest (Romania) alexandru.aldea@utcb.ro; florin.pavel@utcb.ro
Sector	European
Thematic area	International standardisation
EQF level	Level 6 (Bachelor)
ISCED-F field	0732 Building and Civil Engineering
ESCO skills & competences	S2.1.3 interpreting technical documentation and diagrams S4.1.4 developing policies and legislation K0732 building and civil engineering
Proposed dates of the classes	9/12/2024, 11/12/2024, 18/12/2024, 08/01/2025, 15/01/2025, 17:00-19:00 (CET)
One hour for tutoring consulations	20/01/2025, 17:00-18:00 (CET)
Date of the exam/ final assessment	22/01/2025, 17:00-19:00 (CET)
Synchronous & asynchronous hours	Synchronous contact hours: 10 h Asynchronous hours & self-directed learning: 15 h
General description	Official documents at all levels (university, working place, public administration at local, regional, and national level, EU, UN institutions, etc.) as well as media and social media are nowadays full of concepts like hazard, vulnerability, risk, durable, sustainable, resilient. Many people are misunderstanding or missing the proper use of these concepts and their meaning. Through this course, participants will understand the concepts and their correct use in different circumstances, through case studies.
Description of the content (week by week)	Unit 1. Concepts of hazard, vulnerability, risk and resilient in official documents at all levels (university, working place, public administration at local, regional, and national level, EU, UN institutions, etc.) as well as media and social media. (4 hours) Unit 2. Concept of durability in official documents at all levels (university, working place, public administration at local, regional, and national level, EU, UN institutions, etc.) as well as media and social media. (1 hour)

	Unit 3. Concept of sustainable in official documents at all levels (university, working place, public administration at local, regional, and national level, EU, UN institutions, etc.) as well as media and social media. (2 hours) Unit 4. Proper use of concepts (3 hours)
Importance for society	Appropriate use of concepts like hazard, vulnerability, risk, durable, sustainable, resilient is essential since the SDG's are more and more part of professional and social realities. A clarification of concepts is beneficial for nowadays citizens, regardless their field of study.
Skills (hard and soft skills)	Hard skills: Understanding and proper use of the concepts for elaborating documents Soft skills: Critical thinking, Communication
Sustainable Development Goals	SDG4. Quality education SDG9. Industry, innovation and infrastructure SDG11. Sustainable cities and communities SDG12. Responsible consumption and production

Learning outcomes	Study methods	Assessment methods	Assignments. Requirements /format	Supervision and identity verification during assessment
Appropriately define, describe and use the concepts of hazard, risk, durable, sustainable, resilient.	Lecture, discussions, Individual work	Written assessment	Individual work	Supervised online with identity verification
Distinguish and explain the use of the concepts in social and institutional environment.	Lecture, discussions, group work	Quizz	Group work	Supervised online with identity verification

Bibliography	**Websites:** 1. Disaster Resilience Scorecard for Cities, https://www.unisdr.org/campaign/resilientcities/assets/toolkit/Scorecard/UNDRR_Disaster%20resilience%20%20scorecard%20for%20cities_Detailed_English.pdf 2. Sendai Framework for Disaster Risk Reduction 2015 – 2030, https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

3. Mitchell, A. (2013) Risk and Resilience: From Good Idea to Good Practice. https://www.oecd.org/dac/conflict-fragility-resilience/docs/FINAL%20WP%2013%20Resilience%20and%20Risk.pdf
4. Schofield, H., Twigg, J. (2019) Making Cities Sustainable and Resilient, https://www.preventionweb.net/files/66413_undrrlessonslearnedfromdevcoproject.pdf
5. Hofmann, S.H. (2021) 100 Resilient Cities program and the role of the Sendai framework and disaster risk reduction for resilient cities. Progress in Disaster Science, 11: 100189. https://www.sciencedirect.com/science/article/pii/S2590061721000491
6. UN Common Guidance on Helping Build Resilient Societies. https://unsdg.un.org/sites/default/files/2021-09/UN-Resilience-Guidance-Final-Sept.pdf
7. Building Regulation for Resilience. https://www.gfdrr.org/sites/default/files/publication/BRR%20report.pdf
8. Mapping Resilience for the Sustainable Development Goals, https://www.undrr.org/media/88718