COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Financial and Management Engineering		
LEVEL OF STUDIES	Postgraduate (MSc)		
COURSE CODE	I.4	**SEMESTER**	A
COURSE TITLE	Sustainability Principles and Practices		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
	Lectures	3	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE *general background, special background, specialization, general education, skills development*	- General background - Specialization - General education - Skills development		
PREREQUISITE COURSES	No		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	English		
MODE OF TEACHING *in-person (%) synchronous distance learning (%) asynchronous distance learning (%) (In the case of synchronous distance learning, the total weekly duration of teaching is recorded)*	Synchronous distance learning (100 %)		
AVAILABILITY TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://aisbd.aegean.gr/en/c/sustainability-principles-and-practices		

(2) LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Brief Guide for drafting Learning Outcomes*

This course provides an integrated understanding of sustainability management, bridging the gap between environmental limits and corporate strategy. Students will learn to identify and interpret the complex interplay between ecological boundaries and economic value creation. By completing this program, learners will be equipped to design and evaluate resilient systems that align organizational growth with global planetary health and social equity.

The following learning outcomes define the specific knowledge, skills, and competences acquired:

- Students will recognize and state the nine Planetary Boundaries, while identifying the specific UN Sustainable Development Goals (SDGs) and ESG indicators relevant to modern industrial operations.
- Graduates will explain the concept of Double Materiality and evaluate how environmental externalities and social impacts interact to define a firm's long-term financial viability.
- Participants will calculate environmental footprints using Life Cycle Assessment (LCA) methodologies and examine operational data to produce decarbonization strategies for the energy transition.
- Students will differentiate between various Decarbonization Pathways, subdividing complex supply chains into constituent parts to develop more transparent and ethical procurement networks.
- Learners will synthesize economic theories with ecological constraints to create and propose Circular Economy models that reorganize traditional linear production into regenerative systems.
- Students will judge the ethical validity of labor practices and argue for specific Social Sustainability interventions, concluding which leadership strategies best mitigate algorithmic and human rights risks.
- Students will reconstruct corporate governance frameworks to construct and revise future-proof leadership roadmaps that navigate emerging regulatory landscapes and global sustainability horizons.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

Search, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adaptability to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Other…*
	…….

- Search, analysis and synthesis of data and information, with the use of the necessary technology
- Adaptability to new situations
- Decision-making
- Working independently
- Team work
- Working in an international environment
- Working in an interdisciplinary environment
- Project planning and management
- Respect for difference and multiculturalism
- Respect for the natural environment
- Showing social, professional and ethical responsibility and sensitivity to gender issues
- Criticism and self-criticism
- Production of free, creative and inductive thinking

(3) COURSE SYLLABUS

Lecture 1: Planetary Boundaries
Lecture 2: Economics of Sustainability
Lecture 3: The UN Sustainable Development Goals (SDGs)

Lecture 4: ESG Metrics and Double Materiality
Lecture 5: Life Cycle Assessment
Lecture 6: The Circular Economy
Lecture 7: Sustainable Supply Chain Management
Lecture 8: Decarbonization Pathways and Energy Transition
Lecture 9: Social Sustainability and Ethics
Lecture 10: Governance and Leadership

(4) TEACHING AND LEARNING METHODS - ASSESSMENT

<table>
<tr><td>MODE OF TEACHING
Face-to-face, distance learning, etc.</td><td>Distance learning</td></tr>
<tr><td>MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS</td><td>- Discussions during lectures

- Use of email, eClass platform, teleconferencing (e.g., Google Meet), chat platforms, and social media (e.g., WhatsApp, Viber) to communicate with students outside of class</td></tr>
<tr><td>ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS
Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.</td><td>- Group projects and discussions during lectures

- Use of email, video conferencing (e.g., Google Meet), chat platforms, and social media (e.g., WhatsApp, Viber) for student communication outside of class</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, in laboratory training, in the communication with students</td><td>- PowerPoint presentations
- Teaching materials, announcements, and communication via the eClass platform
- Communication with students via email
- Use of videoconferencing platforms (e.g., Google Meet), messaging apps, and social media (e.g., WhatsApp, Viber) for interaction between students and instructors</td></tr>
<tr><td>TECHNOLOGICAL EQUIPMENT REQUIREMENTS</td><td>- Internet access
- Use of a web browser</td></tr>
<tr><td>PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS</td><td>- Software for detecting plagiarism (Turnitin)</td></tr>
<tr><td>ARTIFICIAL INTELLIGENCE POLICY
(1) The use of Artificial Intelligence is prohibited in all circumstances
(2) The use of Artificial Intelligence is allowed only with the permission of the instructor
(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature
(4) Students are free to use Artificial Intelligence</td><td>The use of Artificial Intelligence is allowed only with the permission of the instructor</td></tr>
<tr><td>ORGANISATION OF TEACHING
The mode and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.

The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>30</td></tr>
<tr><td>Literature review and analysis</td><td>27</td></tr>
<tr><td>Independent study</td><td>90</td></tr>
<tr><td>Exams</td><td>3</td></tr>
<tr><td>Total Course Hours</td><td>150</td></tr>
</table>
</td></tr>
<tr><td>STUDENT ASSESSMENT</td><td></td></tr>
</table>

Description of the assessment method *Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Written exams at the end of the course in English, featuring various question types (essay, multiple choice, true/false, and matching) (60%). Oral presentation of group project (40%).

(5) RECOMMENDED BIBLIOGRAPHY

- Suggested bibliography:

- Raworth, K. (2018). Doughnut economics: Seven ways to think like a 21st century economist. *Chelsea Green Publishing.*
- Meadows, D. (2008). Thinking in systems. *Chelsea Green Publishing.*
- Galaz, V. and M. Schewenius (eds, 2025). AI for a Planet Under Pressure. *Stockholm Resilience Centre, - Potsdam Institute for Climate Impact Research. Stockholm.*
- Webster, K. (2015). The circular economy: A wealth of flows. *Ellen MacArthur Foundation Publishing*.
- Lovins, A. B., Lovins, L. H., & Hawken, P. (1999). Natural capitalism: Creating the next industrial revolution. *Little, Brown and Company*.
- Sachs, J. D. (2015). The age of sustainable development. In The age of sustainable development. *Columbia University Press*.
- Cohen, R. (2020). Impact: Reshaping capitalism to drive real change. *Ebury Press*.
- Krosinsky, C., & Purdom, S. (Eds.). (2016). Sustainable Investing: Revolutions in theory and practice. *Routledge*.
- Hauschild, M. Z., Rosenbaum, R. K., & Olsen, S. I. (2018). Life cycle assessment (Vol. 2018). *Springer*.
- Jolliet, O., Saadé-Sbeih, M., Shaked, S., Jolliet, A., & Crettaz, P. (2015). Environmental life cycle assessment. *CRC Press*.
- Stahel, W. R. (2019). The circular economy: A user's guide. *Routledge*.
- McDonough, W., & Braungart, M. (2010). Cradle to cradle: Remaking the way we make things. *North Point Press.*
- Sarkis, J. (2019). Handbook on the sustainable supply chain. *Edward Elgar Publishing*.
- Smil, V. (2022). How the world really works: A scientist's guide to our past, present and future. *Viking*.
- O'neil, C. (2017). Weapons of math destruction: How big data increases inequality and threatens democracy. *Broadway Books*.
- Perez, C. C. (2019). Invisible women: Data bias in a world designed for men. *Chatto & Windus*.
- Polman, P., & Winston, A. S. (2021). Net positive: How courageous companies thrive by giving more than they take. *Harvard Business Review Press.*

- Related academic journals:

- Nature Sustainability
- IEEE Transactions on Sustainable Energy
- Renewable and Sustainable Energy Reviews
- Sustainable Cities and Society
- Sustainable Technology and Entrepreneurship
- Sustainable Production and Consumption
- Sustainable Operations and Computers
- Resources, Environment and Sustainability
- Green Technologies and Sustainability