



**Academic Year 2022-2023
Syllabus
Environmental Quality Engineering
6 CFU
Prof. Giulia Costa**

Course Description

The course focuses on some of the key global environmental challenges that our Planet is currently facing and on the strategies that are being developed to address them both from a policy/legislative perspective and from a technological one.

The main objective of this course is to provide students with a fundamental understanding of complex environmental problems and of the main legislative and technical measures for mitigating human impacts on the environment. To this aim, the students will be provided with scientific and technical background for understanding and discussing complex environmental issues and possible solutions. In addition, the main aims and contents of international protocols, standards and framework directives, as well as of the main procedures and tools developed to manage and assess environmental impacts related to systems, processes or products will be examined.

Based on the knowledge acquired in the course, the students will be able to form their own opinions on global environmental issues and communicate them effectively.

Teaching Method

The course is carried out mainly through lectures and power point presentations prepared by the instructor. However, the active participation of the students is encouraged through class discussions and group presentations. One or two field visits to water or waste treatment plants may also be planned, if possible and on the basis of the interest of the students. Experts may also be invited to provide lectures on specific topics.

Schedule of Topics

Topic 1	Introduction: overview of environmental sustainability, contamination phenomena in different environmental compartments (air, water and soil), environmental measurements and environmental cycles.
Topic 2	Water quality issue, management and treatment: EU water framework Directive, traditional treatment processes in developed countries and approaches/technologies for the developing world.
Topic 3	Integrated waste management strategies and technologies. Food waste management
Topic 4	Urban air quality issue and treatment strategies; mitigation strategies for global issues: stratospheric ozone depletion and climate change.
Topic 5	Contaminated sites issue, management and remediation strategies. Case of Brownfield regeneration.
Topic 6	Environmental impact assessment tools (life cycle assessment and environmental footprint).
Topic 7	Environmental quality management tools (environmental management systems, EMAS, Eco-label).

Textbook and Materials

Reading material on each course topic (handouts, reports, scientific papers and links to websites), will be made available to the students by the course instructor during the course and distributed also to students who are not in position to attend the course, provided they send the course instructor an e-mail at the beginning of the course (within September 2022) stating that they will take the exam as non attending participants.

Main textbook (not to be purchased): “Environmental Engineering: Fundamentals, Sustainability, Design” by Mihelcic and Zimmerman, Wiley, 2014.

Assessment

Assessment will be carried out through a written exam, an oral discussion and a group presentation prepared on a topic selected together with the course instructor. In order to pass the exam each student will have to attain a sufficient grade in all three types of examination. The final grade will be based on the grades of the three types of examination as follows: written exam (50%), oral discussion (25%) and group presentation (25%). Students who do not pass one/more parts or reject the mark of one/more parts will be assessed on the final written and oral exams.

During the course, two written exams will be carried out; tentatively, the first will regard topics 1 to 3 and the second topics 4 to 7. The grade of the written exam will be calculated as the average of the grades obtained in the midterms. The grades of each midterm will have to be sufficient in order to pass the written exam.

Students that do not take or fail one or more of the mid-term exams will take the final written exam regarding the entire course program, scheduled during the winter session and in the September session.

The oral discussion will be held after the written exam and will consist in a discussion of the written exam and include 1 or 2 questions on the course program. Students with a high class attendance (>80%) that are also attentive and actively participate to the lessons may be exempted from the oral discussion.

As for the group presentation, the class will be divided in groups of 3-4 students that will each select together with the course instructor a topic to study and prepare a Power Point presentation on. The presentations prepared by each group will be given by the students in front of the whole class in an event that will be scheduled at the end of the course, or during the course.

Students will be able to keep the results of intermediate tests only if they complete the exam within the winter exam session, otherwise the whole exam will have to be redone in another session.

The exam for non-attending students (more than 20% of absences) consists in the final written exam regarding the entire course program (50% of the final grade), followed by the oral discussion (25% of the final grade) and presentation on a topic selected together with the course instructor (25% of the final grade). The exam will take place during the winter session (2 dates in February 2022) or in the September 2023 session.

Office hours

Monday-Friday 10 A.M.-6 P.M (upon appointment by e-mail).

E-mail

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NOTE: If you are an Erasmus or a non Global Governance student who would like to attend one or more courses in the Global Governance programme, please be aware that, **before enrolling in the course**, you should have read the code of conduct and the procedural rules characterizing our programme. We assume that, if you enroll in the course, **you have read and accepted all Global Governance values and rules**. Notice that attendance is required from the very first lesson and you need to attend at least 80% of the course to be considered an attending student.