



## INTRODUCTION

**Course description:** This course will explore different perspectives and techniques for mitigating environmental impacts of human activities. We will take a close look at the concept of landscape restoration, we will think about why and when restoration activities must be applied, we will learn the basics of restoration project planning, and we will analyze real cases.

- **Degree:** Double degree Biology + Environmental sciences
- **Module in the Degree Program:** Module IV. Land zoning and conservation.
- **ECTS:** 6
- **Year, semester:** 4th year, 2nd semester
- **Type of course:** required
- **Instructor:** Ana Villarroya
- **Language:** English and Spanish
- **Room, Schedule:** room 15, Wednesdays and Thursdays 14.00 to 16.00

## LEARNING OUTCOMES (Competencies)

### *Basic competences*

CB3. To be able to gather and interpret relevant data (usually within the field of study) to build opinions that show reflection on relevant social, scientific or ethical issues.

CB4. To be able to communicate information, ideas and answer questions to specialist and non-specialist audiences.

CB5. To develop the abilities to undertake future studies on an autonomous manner.

### *Generic competences*

CG2. To think on an integrated way and to tackle problems from different points of view.

CG3. To have critical sense.

CG4. To work as part of a team.

CG5. To have a sense of responsibility towards the environment and the ecosystem.

CG6. To manage information.

### *Specific competences*

CE14. To elaborate management plans for plant and animal populations (including threatened and endangered species).

CE32. To design sustainability indicators and calculate environmental footprint.

CE34. To know the principles and techniques of environmental restoration and rehabilitation.

## SYLLABUS

- Fundamentals of Landscape Restoration
- About the landscape
  - Basic concepts: remembering EIA



- Landscape assessment
  - Nature, landscape, and human wellbeing
- Introduction to landscape restoration
  - A general view
  - Ecological basics and restoration trajectories
  - Goals and perspectives on landscape restoration
- Land vocation
- The restoration project
  - Geomorphology
  - Soil
  - Revegetation
  - Fauna
  - Society
  - Follow-up

Project: critical study and elaboration of an executive summary of an actual restoration plan.

## EDUCATIONAL ACTIVITIES

Activities	Methodology	Correspondence to competences
Theoretical lectures - 0,96 ECTS (24h)	Lectures in the room. Student participation is highly encouraged and valued	CB3, CB5, CG2, CG3, CG5, CG6, CE14, CE32, CE34
Applied sessions - 0,56 ECTS (14h)	Practical sessions to apply theoretical knowledge to the course project	CB3, CB4, CB5, CG4, CG6, CE14, CE34
Assessment seminars - 0,16 ECTS (4h)	Public defense and self-assessment of the course final project. Experts from different affiliations may join some of the sessions	CB4, CG3, CG4
Field trips - 0,24 ECTS (6h)	Visits to restoration projects in nearby places	CG3, CG5, CE5
Course project - 1,72 ECTS (43h)	Individual and team work that applies the contents of the course	CB3, CB4, CB5, CG2, CG3, CG4, CG6, CE5, CE14, CE32
One-to-one tutorials - 0,2 ECTS (5h)	Personal interviews with the teachers to get help with personal learning and to solve questions	CG3, CG6



Personal study - 0,66 ECTS (16,5h)	Time dedicated to understand and assimilate concepts discussed in class	CB3, CB5, CG2, CG3, CG6, CE5, CE34
Environment and Landscapes Program - 1,5 ECTS (37,5h)	National and international trips to study restoration projects	CB3, CG2, CG3, CG4, CG5, CE5, CE34
<b>Total dedication:</b>	<b>6 ECTS (150h)</b>	

## GRADING

### REGULAR CALL (MAY)

The final grade will be calculated as the wheighted average of the E&LP grade (trip to Wales) and the present course grade, as follows:

$$\text{Final grade} = (\text{E\&LP} \times 0.25) + (\text{LR} \times 0.75)$$

Criteria for calculating the LR course grade:

1. Students will work on a course project during the whole semester. It will include individual and teamwork, and a public defense at the end of the course. The grade of the project will represent 50% of the final grade of the course.
2. Individual assignments will represent 25% of the final grade. These exercises will be graded according to the quality of their writing (grammar, orthography), their relation to the reference text, and the depth and coherence of the student's answer to the question.
3. The final exam will represent 25% of the final grade.

Submitting all parts (project, individual assignments, and exam) is mandatory to pass the course.

A proactive attitude during the sessions may rise the final grade up to one point.

### SECOND CALL (JUNE)

Only the final exam can be repeated in June. In extraordinary cases, there might exist the possibility of a second attempt at some of the individual assignments.

## OFFICE HOURS

Pleas ask for an appointment by email ([avillarroya@unav.es](mailto:avillarroya@unav.es))

## BIBLIOGRAPHY AND RESOURCES

### Textbooks



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Gómez Orea, D. (2014). *Recuperación de espacios degradados*. Ediciones Mundi-Prensa. [Find it in the Library](#)

Kimmerer, R.W. (2021). *Una trenza de hierba sagrada : saber indígena, conocimiento científico y las enseñanzas de las plantas*. Capitán Swing. [Find it in the Library](#). [English version: Kimmerer, R.W. (2013). *Braiding sweetgrass*. Milkweed Editions. [Find it in the Library](#)]

Leopold, A. (2017). *Una ética de la Tierra* (J. Riechmann, Ed.). Colección Clásicos del Pensamiento Crítico. Catarata. [Find it in the Library](#) [English version: Leopold, A., & Meine, C. (2013). *A Sand County almanac & other writings on ecology and conservation* (2nd printing). The Library Of America. [Find it in the Library](#)]

## Reports

CHELMSFORD CITY COUNCIL (2017). *Landscape Sensitivity and Capacity Assessment*. URL: [https://www.chelmsford.gov.uk/\\_resources/assets/attachment/full/0/72988.pdf](https://www.chelmsford.gov.uk/_resources/assets/attachment/full/0/72988.pdf)

EPA (n.d.). *Wetlands compensatory mitigation Factsheet*. URL: [https://www.epa.gov/sites/default/files/2015-08/documents/compensatory\\_mitigation\\_factsheet.pdf](https://www.epa.gov/sites/default/files/2015-08/documents/compensatory_mitigation_factsheet.pdf)

IPBES (2018): The IPBES assessment report on land degradation and restoration. Montanarella, L., Scholes, R., and Brainich, A. (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 744 pages. <https://doi.org/10.5281/zenodo.3237392>

IUCN (2021). *Biodiversity offsets (Issues brief)*. URL: <https://iucn.org/resources/issues-brief/biodiversity-offsets>

Nelson, C.R., Hallett, J.G., Romero Montoya, A.E., Andrade, A., Besacier, C., Boerger, V., Bouazza, K., Chazdon, R., Cohen-Shacham, E., Danano, D., Diederichsen, A., Fernandez, Y., Gann, G.D., Gonzales, E.K., Gruca, M., Guariguata, M.R., Gutierrez, V., Hancock, B., Innecken, P., Katz, S.M., McCormick, R., Moraes, L.F.D., Murcia, C., Nagabhatla, N., Pouaty Nzembialela, D., Rosado-May, F.J., Shaw, K., Swiderska, K., Vasseur, L., Venkataraman, R., Walder, B., Wang, Z., & Weidlich, E.W.A. (2024). *Standards of practice to guide ecosystem restoration – A contribution to the United Nations Decade on Ecosystem Restoration 2021-2030*. Rome, FAO, Washington, DC, SER & Gland, Switzerland, IUCN CEM. <https://doi.org/10.4060/cc9106en>

SER (2004). International Primer on ecological restoration. [https://www.ser.org/resource/resmgr/custompages/publications/SER\\_Primer/ser\\_primer.pdf](https://www.ser.org/resource/resmgr/custompages/publications/SER_Primer/ser_primer.pdf)

SER (2019). International Principles and Standards for the practice of ecological restoration. 2nd Edition. [SER2019\\_international\\_standards\\_.pdf](#)

SWANWICK, C. (2002). *Landscape Character Assessment: guidance for England and Scotland*. URL: <https://www.nature.scot/sites/default/files/2018-02/Publication%202002%20-%20Landscape%20Character%20Assessment%20guidance%20for%20England%20and%20Scotland.pdf>

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## Papers

Bartholomew, D., et al. (2026). Open letter: The need for a site-based biodiversity standard measuring and certifying impacts from nature-based projects. Plants People Planet. <https://doi.org/10.1002/ppp3.70169>



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Moffat, K., Lacey, J., Zhang, A., & Leipold, S. (2016). The social licence to operate: A critical review. *Forestry (London)*, 89(5), 477–488. <https://doi.org/10.1093/forestry/cpv044> [Find it in the Library](#)

Montanarella, L., Pennock, D. J., McKenzie, N., Badraoui, M., Chude, V., Baptista, I., Mamo, T., Yemefack, M., Singh Aulakh, M., Yagi, K., Young Hong, S., Vijarnsorn, P., Zhang, G.-L., Arrouays, D., Black, H., Krasilnikov, P., Sobocká, J., Alegre, J., Henriquez, C. R., ... Vargas, R. (2016). World's soils are under threat. *Soil*, 2(1), 79–82. <https://doi.org/10.5194/soil-2-79-2016> [Find it in the Library](#)

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## Websites

Paisaje en Navarra: <https://paisaje.navarra.es/>

## Other

Augé, M., & Mizraji, M. (2017). *Los «no lugares» espacios del anonimato : una antropología de la sobremodernidad* (Edición conmemorativa.). Gedisa. [Find it in the Library](#)

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Careri, F. (2014). *Walkscapes : el andar como práctica estética*. Editorial Gustavo Gili. [Find it in the Library](#)

Careri, F., & Pla, M. (2016). *Pasear, detenerse* (1st ed.). Editorial Gustavo Gili. [Find it in the Library](#)

Carson, R., Darling, L., & Darling, L. (1962). *Silent spring*. Houghton Mifflin. [Find it in the Library](#)

Carson, R., Kelsh, N., & Lear, L. (2017). *The sense of wonder : a celebration of nature for parents and children*. Harper Perennial. [Find it in the Library](#)

Falcon, A., Rivero, M., Pujol-Xicoy, I., & Casanovas, J. (2007). *Espacios verdes para una ciudad sostenible : planificación, proyecto, mantenimiento y gestión*. Gustavo Gili. [Find it in the Library](#)

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