

Code: 1591 Ecological Impacts and Sustainability**Degree:** 2nd cycle – Bioenergy Systems Engineering**Curricular Year:** 2nd**Semester Course:** 1st**Credits:** 6 ECTS**Compulsory****Language:** Portuguese/English**Responsible:** Cristina Branquinho Fernandes**Other lecturer(s):** Otilia Correia**Web Site:** <http://www.isa.utl.pt/home/node/3924>**1. Contact hours:****Lectures 30 Practicals/Laboratory 40 Others 14 Total 84****2. Objectives:**

The main objective of this course is to develop the skills that allow the identification of the most important ecological impacts assessed through the use of ecological indicators. It is also important that the students at the end of the course know how to adopt mitigation strategies for the ecological restoration of ecosystems in a sustainability perspective.

3. Programme:

- Principles of ecosystems sustainability and ecological indicators
- Ecological integrity and ecosystems functioning. Ecosystems properties as integrated systems. Ecosystems resilience vs stability.
- Vegetation human impact. Impacts and disturbances on Mediterranean ecosystems. Fire and invasive species impacts.
- Indicators of ecological integrity. Some case studies:
 - Impacts in the vegetation structure and landscape; habitat fragmentation
 - Desertification and fire risk
 - Impacts on soil resources and quality
 - Impacts on superficial and groundwater water quality and quantity
 - Ecological Impacts on the marine and terrestrial ecosystems interface
 - Ecological Impacts of atmospheric pollution
 - Ecological indicators for assessing the human health impact
 - Ecological Impacts of climate changes
 - Ecological strategies for mitigation, rehabilitation and restoration of degraded areas.

4. Bibliography:**Main Bibliography**

- F. Stuart Chapin III, Margaret S. Torn and Masaki Tateno. 1996. Principles of Ecosystem Sustainability. The American Naturalist, Vol. 148:1016-1037
- Smith R.L., Smith T.M. 2001. Ecology and field biology. Benjamin Cummings. California, pp: 766.
- Cunningham W.P., Cunningham M.A. 2004. Environmental Science: A Global Concern. Mcgraw-Hill College; 8th Edition,
- Smith R.L., Smith T.M. 1998. Elements of Ecology. Addison Wesley Longman, Inc. California, pp: 577.
- Raven PH, Berg LR. 1998. Environment. Harcourt College Publishers, New York, pp:612
- Nebel B.J., Wright R.T. 1998. Environmental Science. The Way The World Works. Prentice-Hall International, Inc. New Jersey, pp: 698.

Other Bibliography

National Research Council (NRC). 2000. ECOLOGICAL INDICATORS FOR THE NATION. NATIONAL ACADEMY PRESS, Washington

5. Assessment:**Continuous evaluation**

Method of evaluation of the knowledge and skills will be based:

- 1) Individual written work - 50%*
- 2) Individual work on ecological impacts applied to the subject of the master's thesis - 50% *

* Weight of each element of assessment 0

6. Estimated Workload:

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| 168 | Hours |
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7. Last Update:

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| 21/7/2010 |
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