Stress Ecology

Synopsis

The human society faces global environmental challenges, such as human population in accelerated growth, pollution, climate changes. Human resources with advanced training in Stress Ecology are needed to address and overcome such challenges contributing to societal development and sustainability of life on earth.

Aims

To get knowledge and practical training on Stress Ecology.

Objectives

At the end of the Unit, you should:

1. Have fundamental and applied concepts in the scope of Stress Ecology, and training on methods and techniques commonly used in stress ecology and on new approaches necessary to address and overcome major environmental problems (e.g. climate changes, bioinvasions, pollution, biodiversity lost).
2. Have the stimulus and skills to get continuous upgrade of knowledge and training and to apply them in problem solving in the scope of Stress Ecology.
3. Have the capability of working in a team, in an integrated and multidisciplinary way in the scope of Stress Ecology.
4. Have developed autonomy and skills to promote consensual choices, to analyse and discuss results, make decisions and communicate results, risks and decisions to different types of audience in distinct contexts.

Syllabus

Topics covered include:

- Main ecological paradigms and challenges.
- Development, biodiversity and conservation, sustainability.
- Main regulation and conventions.
- Environmental stressors. Global pollutants and environmental contaminants of special concern (e.g. microplastics, nanomaterials).
- Methods and techniques commonly used in Ecology and ecotoxicology to assess the effects of stressors on populations, communities and ecosystems.
- Effects of environmental stressors (physical, chemical, biological) on interspecific relationships; adaptations, resistance and differences among species.
- Effects of individual environmental stressors on communities and ecosystems (terrestrial, freshwater, marine).
- Combined effects of climate changes, pollution and bioinvasions in ecosystems of different regions (temperate, cold, tropical, extreme environments).
- Implications to biodiversity conservation, environmental and human health, and ecosystem services.

Learning & Teaching

- Lectures: 18 hr
- Practical and laboratory work: 24 hr
- Seminar: group work with oral presentation

Teaching Staff

L. Guilhermino (Coord.), M.J. Rocha

Semester: 2

Timetable slot: To be advised

ECTS: 6

Level: Compulsory

Bibliography

- Araújo, C.M.V.; Shinn, C. (Eds.). 2017. Ecotoxicology in Latin America. Nova Publishers, New York, 591 p. ISBN: 978-1-53610-609-1.
- Barnthouse LW; Munn Jr WR; Sorensen MT 2007. Population-level Ecological Risk Assessment. SETAC & CRC – Taylor & Francis Group.
- Begon M; Townsend CR; Harper JL 2009. Ecology: From Individuals to Ecosystems. Blackwell Publishing.
- Sheppard, C.R.C. (Ed.) 2019. World Seas: An Environmental Evaluation. 2nd Edition, Vol. III: Ecological Issues and Environmental Impacts. Academic Press.
- Steinberg CEW 2012. Environmental Stress as Ecological Driving Force and Key Player in Evolution. Springer.
- recent articles and several websites

Assessment

- Written examination (50%)
- Continuous evaluation (10%)
- Seminary and oral presentation (40%)

Course Evaluation

By completion of University Unit Evaluation Questionnaire by students, annual assessment by Unit Coordinator.