

COASTAL AND MARINE BIOLOGY AND ECOLOGY (LM51)

(Lecce - Università degli Studi)

Insegnamento MARINE BIODIVERSITY AND ECOSYSTEM FUNCTIONING

GenCod A004351

Insegnamento MARINE BIODIVERSITY AND ECOSYSTEM FUNCTIONING

Insegnamento in inglese MARINE BIODIVERSITY AND ECOSYSTEM

Settore disciplinare BIO/05

Corso di studi di riferimento COASTAL AND MARINE BIOLOGY AND ECOLOGY

Tipo corso di studi Laurea Magistrale

Crediti 6.0

Ripartizione oraria Ore Attività frontale: 48.0

Per immatricolati nel 2018/2019

Erogato nel 2019/2020

Anno di corso 2

Lingua INGLESE

Percorso PERCORSO COMUNE

Docente SERGIO ROSSI

Sede Lecce

Periodo Primo Semestre

Tipo esame Orale

Valutazione Voto Finale

Orario dell'insegnamento

<https://easyroom.unisalento.it/Orario>

BREVE DESCRIZIONE DEL CORSO

Biodiversity and ecosystem functioning are tightly related. In this course, we will study how important are the concepts of biodiversity, demography and population dynamics, trophic ecology and life cycles, environmental factors and biochemical cycles in understanding pelagic and benthic system functioning. Once these concepts and the related methods to quantify such parameters are explained, we will make a wide spectra of systems (e.g. coral reefs, Mediterranean sea, polar areas, deep sea communities, etc.), stressors and impacts to understand how the functioning of the pelagic and benthic systems in the oceans are changing. Direct impacts such as fisheries, pollution or coast transformation will be analyzed. The synergistic path with indirect stressors such as rising temperatures, ocean acidification or sea level rise will be also studied to understand how deep is the change on the functioning of these ocean systems. Finally, we will give tools for management and conservation: new aquaculture methods, new fishery approaches, marine restoration and marine protected areas design and management guides to improve ecosystem functioning enhancing biodiversity and complexity.

PREREQUISITI

Fundamentals of general biology, zoology, botany and ecology are prerequisites to achieve high proficiency of this course

OBIETTIVI FORMATIVI

The student has to achieve the biodiversity and ecosystem function concepts but, more important, she/he has to be capable to apply quantitative tools to asses such functionality. She/he has to have at hand conservation and management measures/tools to confront real conservation/regulation measures.

METODI DIDATTICI

The six credits are based on theoretical and practical concepts, with an open debate during the classroom.

MODALITA' D'ESAME

The achievement of the credits attributed to teaching is obtained through an oral exam: four questions of the different developed concepts. Four perfect answers will give 28/30 punctuation. To reach the maximum score, before starting the oral exam, the student has to make a brief presentation based on a paper, book chapter or review related with the marine biodiversity and ecosystem functioning subject. The choice of the text to make the presentation is free.

PROGRAMMA ESTESO

Introduction, the value of science. How we are transforming the oceans. Biodiversity, what are we talking about? Biodiversity: different habitats, different organisms, different methods. Posidonia oceanica and biodiversity. Antarctica: pristine environment for Biodiversity case studies. Biodiversity & impacts: examples with the intertidal. Approaching biodiversity with genetics: metabarcoding. Biodiversity: frontier systems. Demography and population dynamics. Demography: precious corals. ROV and other tools for benthic cartography and demography. Demography: some examples OF applied models. Self thinning role: understanding sessile long lived species population structure. Biogeochemical cycles in the ocean. Benthic-pelagic coupling and near bottom seston. Segrasses: an example for biogeochemical cycles. Biogeochemical cycles: carbon sinks. Trophic ecology of suspension feeders and heterotrophic energy inputs. Photobiology: mixotrophic cnidarians and the limits of photoadaptation. The cost of suspension feeding: energy output in suspension feeders. Trophic biomarkers (I): Stable isotopes. Trophic biomarkers (II): Macromolecules. Trophic ecology: combining methods. Trophic interactions and tipping points. Competition for space in benthic organisms. Alien species. Pelagic fisheries: the end of innocence. Bottom trawling: what happened with the cod? Artisanal and leisure fisheries. Medusa swarms: causes, frequency and consequences. Aquaculture: the blue revolution. Red tides, algal blooms & dead Zones. Solid marine pollution. Climate change in the oceans. Climate change and the poles. Changes of energy fluxes in marine animal forests of the Anthropocene: factors shaping the future seascape. Climate change and temperature: The Mediterranean Sea in a future world. Coral reefs, bleaching and El Niño. Ocean acidification. Marine Protected Areas monitoring and management-1. Marine Protected Areas monitoring and management-2. Integrated MultiTrophic Aquaculture (IMTA). Marine restoration. Citizen science and scientific outreach.

TESTI DI RIFERIMENTO

All the material will be provided by the teacher in form of selected books, reviews and scientific papers