
Ano Letivo 2017-18

Unidade Curricular ECOFISIOLOGIA DE PLANTAS MARINHAS

Cursos BIOLOGIA MARINHA (2.º ciclo)
SISTEMAS MARINHOS E COSTEIROS (2.º Ciclo) (*)
BIODIVERSIDADE E CONSERVAÇÃO MARINHA - Erasmus Mundus (2.º Ciclo) (*)

(*) Curso onde a unidade curricular é opcional

Unidade Orgânica Faculdade de Ciências e Tecnologia

Código da Unidade Curricular 14331055

Área Científica CIÊNCIAS BIOLÓGICAS

Sigla CB

Línguas de Aprendizagem English

Modalidade de ensino Presencial

Docente Responsável Rui Orlando Pimenta Santos

| DOCENTE | TIPO DE AULA | TURMAS | TOTAL HORAS DE CONTACTO (*) |
|----------------------------|--------------|------------------------|-----------------------------|
| Rui Orlando Pimenta Santos | OT; S; T | T1; S1; OT1; OT2 | 15T; 5S; 10OT |
| Isabel Maria Alves Barrote | TC; PL; TP | TP1; TP2; PL1; PL2; C1 | 10TP; 20PL; 10TC |

* Para turmas lecionadas conjuntamente, apenas é contabilizada a carga horária de uma delas.

| ANO | PERÍODO DE FUNCIONAMENTO* | HORAS DE CONTACTO | HORAS TOTAIS DE TRABALHO | ECTS |
|-----|---------------------------|-------------------------------|--------------------------|------|
| 1º | S2 | 15T; 5TP; 10PL; 10TC; 5S; 5OT | 168 | 6 |

* A-Anual;S-Semestral;Q-Quadrimestral;T-Trimestral

Precedências

Sem precedências

Conhecimentos Prévios recomendados

None

Objetivos de aprendizagem (conhecimentos, aptidões e competências)

Aims to understand how the ecological observations such as growth, reproduction, survival, abundance and geographical distribution of organisms are determined by physiological mechanisms as these processes are affected by the physical, chemical and biotic environments.

Skills to develop:

- ? To understand the physiological mechanisms and adaptive responses of marine plants from an ecological perspective.
- ? To develop aptitudes related to the application of experimental techniques that allow the analysis and evaluation of adaptive responses of marine plants in relation to various environmental parameters.
- ? To develop aptitudes related to the analyses of experimental data, scientific writing and scientific communication.

Conteúdos programáticos

Light and photosynthesis: Light properties, its behaviour in the water column, light capture by marine plants, photosynthetic responses to light. UV radiation: biological effects, ecological implications. Marine plant distribution in relation to light: chromatic adaptation, ontogenic adaptation.

CO₂: Carbonate balance in the sea, CO₂ uptake and effect of increasing CO₂ Calcium carbonate: calcification, ecological implications, global change effects

Temperature: Effects of temperature in the metabolism, lethal, reproductive and growth limits, temperature and geographical distribution, global warming effects.

Nutrients: Nutrients in the sea, nutrient uptake, nutrient metabolism and ecological significance.

Hydrodynamics: Basics of fluid dynamics, hydrodynamic control of nutrient uptake, processes at plant level, ecological implications.

Water relations: Biochemical and physiological effects of salinity; tolerance and acclimation, synergistic effects with other stressors.

Metodologias de ensino (avaliação incluída)

- Formal lectures introduce the theoretical background of marine plant ecophysiology.

- Practical experiments and sample analysis in the laboratory encourage development of practical skills and teamwork, while supporting the understanding of the theoretical background.

- Results obtained during practical sessions are used to develop skills in data presentation, data analysis and scientific writing. Oral presentations of practical work provide training both in science communication

Evaluation:

Exam: 50% (minimum grade to pass: 8)

Practical paper : 35%

Paper presentation : 15%

Continuous evaluation: the final classification can be adjusted, depending on student participation.

Bibliografia principal

(to complete in the lectures with papers)

Books in Library :

Lu?ning , K. (1990). Seaweeds. Their environment, biogeography, and ecophysiology. John Wiley & Sons, New York.

Lobban , C. S., Harrison, P. J. (1994). Seaweed ecology and physiology. Cambridge University Press, Cambridge.

Hurd CL, Harrison PJ Bischof K and Lobban CS (2015). Seaweed ecology and physiology, 2nd edition, Cambridge University Press, New York.

Salisbury, FB, Ross, CW (1992). Plant Physiology (4a ed.). Wadsworth Publ. Co., Belmont.

Taiz L, Zeiger E (1998) ? Plant Physiology (2nd ed.). Sinauer Associates, Inc., Publishers (<http://5e.plantphys.net/>)

Other relevant Books:

Larkum AWD, Orth RJ and Duarte CM (2006). Seagrasses: Biology, Ecology and Conservation. Springer, Dordrecht, The Netherlands.

Sven Beer, Mats Björk , John Beardall (2014). Photosynthesis in the Marine Environment, Wiley-Blackwell

Academic Year 2017-18

Course unit ECOPHYSIOLOGY OF MARINE PLANTS

Courses MARINE BIOLOGY
MARINE AND COASTAL SYSTEMS (*)
MARINE BIODIVERSITY AND CONSERVATION - Erasmus Mundus (*)

(*) Optional course unit for this course

Faculty / School Faculdade de Ciências e Tecnologia

Main Scientific Area CY BI

Acronym BC GB

Language of instruction English

Teaching/Learning modality Face to face learning

Coordinating teacher Rui Orlando Pimenta Santos

| Teaching staff | Type | Classes | Hours (*) |
|----------------------------|------------|------------------------|------------------|
| Rui Orlando Pimenta Santos | OT; S; T | T1; S1; OT1; OT2 | 15T; 5S; 10OT |
| Isabel Maria Alves Barrote | TC; PL; TP | TP1; TP2; PL1; PL2; C1 | 10TP; 20PL; 10TC |

* For classes taught jointly, it is only accounted the workload of one.

Contact hours

| T | TP | PL | TC | S | E | OT | O | Total |
|----|----|----|----|---|---|----|---|-------|
| 15 | 5 | 10 | 10 | 5 | 0 | 5 | 0 | 168 |

T - Theoretical; TP - Theoretical and practical ; PL - Practical and laboratorial; TC - Field Work; S - Seminar; E - Training; OT - Tutorial; O - Other

Pre-requisites

no pre-requisites

Prior knowledge and skills

None

The students intended learning outcomes (knowledge, skills and competences)

Aims to understand how the ecological observations such as growth, reproduction, survival, abundance and geographical distribution of organisms are determined by physiological mechanisms as these processes are affected by the physical, chemical and biotic environments.

Syllabus

Light and photosynthesis: Light properties, its behaviour in the water column, light capture by marine plants, photosynthetic responses to light. UV radiation: biological effects, ecological implications. Marine plant distribution in relation to light: chromatic adaptation, ontogenic adaptation.

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Hydrodynamics: Basics of fluid dynamics, hydrodynamic control of nutrient uptake, processes at plant level, ecological implications.

Water relations: Biochemical and physiological effects of salinity; tolerance and acclimation, synergistic effects with other stressors.

Teaching methodologies (including evaluation)

- Formal lectures introduce the theoretical background of marine plant ecophysiology. ?
- Practical experiments and sample analysis in the laboratory encourage development of practical skills and teamwork, while supporting the understanding of the theoretical background.
- Results obtained during practical sessions are used to develop skills in data presentation, data analysis and scientific writing. ? Oral presentations of practical work provide training both in science communication

Evaluation:

Exam: 50%

Minimum grade of exam to pass: 8

Practical paper: 35%

Paper presentation: 15%

Continuous evaluation: the final classification can be adjusted, depending on student participation.

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Lobban , C. S., Harrison, P. J. (1994). Seaweed ecology and physiology. Cambridge University Press, Cambridge.

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