
Ano Letivo 2021-22

Unidade Curricular GROUNDWATER DEPENDENT ECOSYSTEMS AND ECOHYDROLOGY

Cursos ECOHIDROLOGIA APLICADA - Erasmus Mundus (2.º Ciclo) (*)

(*) Curso onde a unidade curricular é opcional

Unidade Orgânica Faculdade de Ciências e Tecnologia

Código da Unidade Curricular 19311017

Área Científica CIÊNCIAS DO AMBIENTE

Sigla

Código CNAEF (3 dígitos) 420

Contributo para os Objetivos de Desenvolvimento Sustentável - ODS (Indicar até 3 objetivos) 6,13,15

Línguas de Aprendizagem english

Modalidade de ensino

face to face/remote

Docente Responsável

Luís Manuel Zambujal Chícharo

DOCENTE	TIPO DE AULA	TURMAS	TOTAL HORAS DE CONTACTO (*)
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* 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	S1	12T; 12TP	75	3

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

Precedências

Sem precedências

Conhecimentos Prévios recomendados

ecology, hydrology

Objetivos de aprendizagem (conhecimentos, aptidões e competências)

The main Learning outcomes of the course are to develop an understanding of the functions and occurrences of groundwater resources and to convey the fundamental notions of hydrogeology, from a research point of view as well as for quantitative evaluation of renewable water resources. Particular attention will be dedicated to the relation with ecosystems, in particular those aquatic ones which are directly connected and dependent from groundwater occurrences (GDE). The students will be able to understand and quantitatively evaluate the hydrological balance, to appraise the underground water circulation and to relate it to the different types of GDE. The student will also apprehend the role ecohydrology can play when dealing with GDE which have been altered by human impacts, and solutions to be applied in order to enhance GDE services (quality, quantity, etc.)

Conteúdos programáticos

PC 1: Hydrological cycle and water circulation in different geological systems

PC 2: Aquifer types - shallow, unconfined, confined

PC 3: Hydrogeological balance: rainfall, temperature, potential evaporation and evapotranspiration

PC 4: Porosity definitions and use. Groundwater flow in saturated and unsaturated soil, porous rocks or fractured rocks

PC 5: Hydrochemistry of groundwater and natural tracers (isotopes)

PC 5: Reconstruction and interpretation of piezometric surfaces and flow nets

PC 6: Notions on groundwater exploration and use (springs, water wells, monitoring wells)

PC 7: GDE classification and occurrences

PC 8: GDE role in catchments

PC 9: GDE related case studies

PC 10: Basics of Ecohydrology and Integrated Water Resource Management (IWRM)

PC 11: Ecohydrology and hydrogeological processes

PC 12: Groundwater-ecosystems interaction

PC 13: Ecohydrological solutions applied to GDE

Metodologias de ensino (avaliação incluída)

The basic knowledge of the program content will be acquired through face-to-face classes. The program content will be explained by applied examples to create understanding of the topic. Moreover, the most recent publications in the field will be analyzed and discussed. Video and e-learning material will be distributed.

Bibliografia principal

1. Braune, E., & Yongxin, X. (2008). Groundwater management issues in Southern Africa - An IWRM perspective. *Water SA*, 34(6), 669-706.
2. Coles-ritchie, M., Gurrieri, J., & Carlson, C. (2012). Groundwater-Dependent Ecosystems: Level I Inventory Field Guide Inventory Methods for Assessment and Planning. Retrieved from https://www.fs.fed.us/geology/GDE_Level_I_FG_final_March2012_rev1_s.pdf

Academic Year 2021-22

Course unit

Courses Applied Ecohydrology - Erasmus Mundus (2.º Cycle) (*)

(*) Optional course unit for this course

Faculty / School FACULTY OF SCIENCES AND TECHNOLOGY

Main Scientific Area CIÊNCIAS DO AMBIENTE

Acronym

CNAEF code (3 digits) 420

Contribution to Sustainable Development Goals - SGD (Designate up to 3 objectives) 6,13.15

Language of instruction english

Teaching/Learning modality face to face/remote

Coordinating teacher Luís Manuel Zambujal Chícharo

Teaching staff	Type	Classes	Hours (*)
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* For classes taught jointly, it is only accounted the workload of one.

Contact hours	T	TP	PL	TC	S	E	OT	O	Total
	12	12	0	0	0	0	0	0	75
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

ecology/hydrology

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

The main Learning outcomes of the course are to develop an understanding of the functions and occurrences of groundwater resources and to convey the fundamental notions of hydrogeology, from a research point of view as well as for quantitative evaluation of renewable water resources. Particular attention will be dedicated to the relation with ecosystems, in particular those aquatic ones which are directly connected and dependent from groundwater occurrences (GDE). The students will be able to understand and quantitatively evaluate the hydrological balance, to appraise the underground water circulation and to relate it to the different types of GDE. The student will also apprehend the role ecohydrology can play when dealing with GDE which have been altered by human impacts, and solutions to be applied in order to enhance GDE services (quality, quantity, etc.)

Syllabus

PC 1: Hydrological cycle and water circulation in different geological systems

PC 2: Aquifer types - shallow, unconfined, confined

PC 3: Hydrogeological balance: rainfall, temperature, potential evaporation and evapotranspiration

PC 4: Porosity definitions and use. Groundwater flow in saturated and unsaturated soil, porous rocks or fractured rocks

PC 5: Hydrochemistry of groundwater and natural tracers (isotopes)

PC 5: Reconstruction and interpretation of piezometric surfaces and flow nets

PC 6: Notions on groundwater exploration and use (springs, water wells, monitoring wells)

PC 7: GDE classification and occurrences

PC 8: GDE role in catchments

PC 9: GDE related case studies

Teaching methodologies (including evaluation)

The basic knowledge of the program content will be acquired through face-to-face classes. The program content will be explained by applied examples to create understanding of the topic. Moreover, the most recent publications in the field will be analyzed and discussed. Video and e-learning material will be distributed.

Main Bibliography

1. Braune, E., & Yongxin, X. (2008). Groundwater management issues in Southern Africa - An IWRM perspective. *Water SA*, 34(6), 669-706.
2. Coles-ritchie, M., Gurrieri, J., & Carlson, C. (2012). Groundwater-Dependent Ecosystems: Level I Inventory Field Guide Inventory Methods for Assessment and Planning. Retrieved from https://www.fs.fed.us/geology/GDE_Level_I_FG_final_March2012_rev1_s.pdf