

POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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Course	Energy and Environment					
Subject	Transfer Phenomena					
Academic year	2023/2024	Curricular year	2nd	Study period	2nd semester	
Type of subject	Compulsory	Student workload (H)	Total: 126	Contact: 60	ECTS	4,5
Professor(s)	PhD Jorge Gregório					
<input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department		PhD Rui Pitarma Ferreira				

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

Give students a basic training in transport phenomena, relevant to the analysis of energy and environmental problems involving processes of heat and mass transfer. Apply and/or develop computational tools for calculating.

2. PROGRAMME

Dimensional analysis: dimensions and units; Nondimensional techniques. General principles of transfer: fluid types, types and flow regimes; integral and differential analysis. Isothermal transport in continuous media: Principles of fluid mechanics. Transportation in non-isothermal continuous media: Heat transfer: conduction and convection; transmission in discontinuous media. Thermal radiation; Transportation in mixtures: Mass transfer by molecular diffusion; Fick's Law; Mass transfer by convection. Drying. Thermal insulation. Heat exchangers.

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

The basic concepts at the level of transfer phenomena are taught in all chapters of the subject program, always giving emphasis to environmental and energetic problems.

4. MAIN BIBLIOGRAPHY

- Oliveira, L.A., Lopes, A.G., "Mecânica dos Fluidos", ETEP (LIDEL), 2006.
- Incropera, F.P., Witt, D.P., "Fundamentos de Transmissão de Calor e de Massa", LTC – Livros Técnicos e Científicos, 2000.
- Kaminski, D. A., Jensen, M. K., "Introduction to Thermal and Fluid Engineering", Wiley, 2005.
- Figueiredo, R., Costa, J. e Raimundo A.; "Transmissão de calor: Fundamentos e Aplicações", Lidel, 2015.
- Holman, J.P., "Transferência de Calor", Mcgraw-Hill, 1983.
- Pitarma, R.A., "Notas didáticas de Mecânica de fluidos", ESTG – IPG, 2013.
- Ramos, F., "Isolamento Térmico na Indústria", ESTG - Instituto Politécnico da Guarda, 2013.

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- Teaching notes and presentations from professor to the subject, 2022.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

The issues are exposed theoretical and practical. Solving exercises. Practices in the Laboratory. Visit places with a implementation of measures in the environment and energy areas. Classroom tutorial support and e-learning.

Continuous evaluation for practical work and/or test. In the continuous evaluation the practical works are worth 40% and the written test is worth 60%. Students get approval to subject if they obtain an assessment equal to or higher than 10. If do not get enough value for approval, the student will be admitted to the exam.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

The basic concepts at the level of transfer phenomena in order to provide capacity for analysis and characterization are provided through the lecture method, case studies and local visit with implementation of measures in the areas of environment and energy.

7. ATTENDANCE

Attendance is strongly recommended but there is no mandatory minimum to be observed by students.

8. CONTACTS AND OFFICE HOURS

Area/Group Coordinator

Name: PhD Rui Pitarma
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 Cabinet nº14

Professor

Name: PhD Jorge Gregório
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 Phone: 271 220 120 – ext:1205
 Phone: 963 000 921
 Cabinet nº5

Office hours: Monday: from 09:00 to 11:00.

9. OTHERS

Not applicable.

DATE

14 de fevereiro de 2024

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SIGNATURES

Professor(s), Area/Group Coordinator or Head of Department signatures

Area/Group Coordinator

(PhD Rui Pitarma)

Professor

(PhD Jorge Gregório)