



POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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Course	Mechanical and Industrial Informatics					
Subject	Fluids and Heat Transfer					
Academic year	2023-2024	Curricular year	1st	Study period	2nd semester	
Type of subject	Compulsory	Student workload (H)	Total: 162	Contact: 60	ECTS	6
Professor(s)	Rui Pitarma					
<input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department	(select)	Rui Pitarma				

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

Acquire the basic fundamental knowledge of Fluid Mechanics and Heat Transfer. Analyse and solve problems involving fluid flows, transformations and mass and energy transfer through a suitable compromise between theory and practice. Become aware of the importance of the fluid and heat transfer phenomena in the industry and the importance of operating the equipment, systems and processes efficiently, ensuring efficient use of energy and natural resources keeping in mind the energy and environmental problems. Acquire the basis to become prepared for learning subsequent subjects.

2. PROGRAMME

1. Introduction and properties of fluids; 2. Basics of fluid statics; 3. Basics of fluid flow; 4. Practical applications of basic equations of static and fluid dynamics 5. Similitude and dimensional analysis; Notes of CFD applications; 7. Basics of turbomachinery; 8. Principles of heat transfer (conduction and convection); 9. Principles of thermal radiation. 10. Practical applications of heat transfer.

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

Chapters 1, 2, 3, 4, 8, and 9 are intended to achieve the main objective of the subject, i.e., provide students with the basic knowledge of fluid mechanics and heat transfer. Chapters 5, 6, 7 and 10 intend to achieve the complementary objective of studying practical applications of the fundamental laws of fluid mechanics and heat transfer, as well as integrating the knowledge acquired to identify, understand and solve a number of engineering problems with practical relevance.

4. MAIN BIBLIOGRAPHY

- Oliveira, Luís Adriano e Gameiro, António Lopes, *Mecânica dos Fluidos*, LIDEL, 6ª Edição, 2020. ISBN: 9789897524929
- Incropera, Frank P., Bergman, T. L., Lavine, A. e DeWitt, David P., *Fundamentos de Transferência de Calor e e Massa*, 7ª ed.; Editora LTC, 2013. ISBN 13: 9788521625049
- Pitarma, R.A., *Mecânica de Fluidos*, IPG. (teacher's notes)

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5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Lectures using audiovisual media, case studies, problem-solving, laboratory assignments and demonstrations. In the classes theoretical, practical and laboratory dimensions are combined, encouraging participation, debate and individual/group reflection. Many educational media are used: schemas in table, multimedia presentations, videos and lab activities. In tutorial orientation sessions the students' questions and suggested studying methods will be analyzed and clarified.

Ongoing evaluation: 10% Attendance +20% Practical works + 70% Final Test (minimum grade required on final test = 7 out of 20).

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

The main objective is globally achieved with the following methodologies: lectures, interactive lessons and laboratory sessions.

The complementary objective is achieved through laboratory sessions, problem-solving and case studies encouraging the individual/group discussion and the debate.

7. ATTENDANCE

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

8. CONTACTS AND OFFICE HOURS

E-mail: rpitarma@ipg.pt;

Office: 14 ; Laboratory: Air conditioning and Environment.


Doubts and questions should be clarified in tutorial hours or service hours.

DATE

18 de março de 2024

SIGNATURES

Professor and Area/Group Coordinator



(signature)