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|------------------|-------------------------------------|---------------|----------------|------------------------------------|-------|
| Course Unit      | Water Supply and Wastewater Systems |               | Field of study | Engineering and Similar Techniques |       |
| Master in        | Environmental Technology            |               | School         | School of Agriculture              |       |
| Academic Year    | 2020/2021                           | Year of study | 1              | Level                              | 2-1   |
| Type             | Semestral                           | Semester      | 1              | ECTS credits                       | 6.0   |
| Code             | 1076-409-1106-00-20                 |               |                |                                    |       |
| Workload (hours) | 162                                 | Contact hours | T 30           | TP -                               | PL 30 |
|                  |                                     |               | TC -           | S -                                | E -   |
|                  |                                     |               | OT 20          | O -                                |       |

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Tomás de Aquino Freitas Rosa Figueiredo

#### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Know and identify the components of the supply water and wastewater systems
2. Understand the procedures for design and analysis of water supply and wastewater systems
3. Use available computer programs for design and analysis of water supply and wastewater systems

#### Prerequisites

Not applicable

#### Course contents

Water supply systems: components and elements for design and analysis; water collection; water transport and storage; distribution networks. Wastewater systems: components and elements for design and analysis; stormwater and sewer systems design.

#### Course contents (extended version)

1. Supply water systems
  - Introduction and system components
  - Water demand and flow rates
  - Water collection: surface and subsurface intake systems
  - Water transmission: systems design and components
  - Water storage: Types of tanks; functional and construction aspects
  - Water distribution networks: general aspects, design and construction
2. Wastewater systems
  - Types and system components
  - Planning and systems design
  - Stormwater system components and design
  - Sewer system components and design
  - Management, operation and maintenance of wastewater systems

#### Recommended reading

1. Baptista, J. M. & Matos, M. R. (Eds. ) 1995. Gestão de sistemas de Saneamento Básico. Direcção Geral do Ambiente, LNEC, Lisboa.
2. Davis, M. L. 2010. Water and wastewater Engineering Design Principles and Practice. McGraw-Hill, New York.
3. Greig, N. S. 2003. Water, Wastewater, and Stormwater Infrastructure Management. CRC Press LLC, Lewis Publishers, New York.
4. Sá Marques, J. A. A. & Sousa; J. J. O. 2008. Hidráulica Urbana. Sistemas de Abastecimento de Água e de Drenagem de Águas Residuais. Imprensa da Universidade de Coimbra, Coimbra.
5. Silva Afonso, A. , 1997. O novo regulamento português de águas e esgotos, anotado e comentado. Vol. I, Casa do Castelo Editora, Coimbra.

#### Teaching and learning methods

Lectures: oral presentation. Lab sessions: resolution of exercises and written reports for the different exercises. Use of computer programs for design and analysis.

#### Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final, Supplementary)
  - Practical Work - 50% (Minimum mark: 9, 5 (0-20))
  - Intermediate Written Test - 50% (Minimum mark: 9, 5 (0-20))
2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100% (The final exam includes the practical component)

#### Language of instruction

Portuguese

#### Electronic validation

|   |                        |                                  |                                |
|---|------------------------|----------------------------------|--------------------------------|
| Tomás de Aquino Freitas Rosa Figueiredo | António Castro Ribeiro | Manuel Joaquim Sabença Feliciano | Elsa Cristina Dantas Ramalhosa |
| 29-10-2020                              | 06-11-2020             | 08-11-2020                       | 08-11-2020                     |