POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	**SUBJECT DESCRIPTION**	**MODELO** PED.013.03

Course	**Energy and Environment**					
Subject	**Solid Waste Management and Treatment**					
Academic year	2023/2024	*Curricular year*	2st	*Study period*	1st semester	
Type of subject	Compulsory	*Student workload (H)*	Total: 182	Contact: 60	*ECTS*	6.5
Professor(s)	Pedro Miguel dos Santos Melo Rodrigues					
☒ *Area/Group Coordinator* ☐ *Head of Department* *(select)*	Rui António Pitarma S. Cunha Ferreira					

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

The student will obtain fundamental knowledge and skills to implement and coordinate solid waste management activities at all levels, namely urban, hospital and industrial, with respect to Production (quantitative and qualitative characterization), Handling, Storage, Processing, Treatment and Recovery, Final Deposition and Systems Control.

2. PROGRAMME

1. INTRODUCTION

1.1 Historical evolution of solid waste management

1.2 Legal framework and regulations applicable to solid waste management

2. PRODUCTION AND COMPOSITION OF SOLID WASTE

2.1 Classification of waste

2.2 Quantitative and qualitative characterization of waste

3. PREVENTION, REDUCTION AND REUSE

4. WASTE COLLECTION AND TRANSPORT SYSTEMS

4.1 Deposition, collection, transport and transfer of waste

4.2 Sorting stations

5. VALUATION AND TREATMENT OF WASTE

5.1 Recycling and new materials

5.2 Biological, thermochemical and energy recovery

5.3 Treatment and recovery of hazardous waste

6. CONTAINMENT

6.1 Landfill

6.2 Reactions, basic processes and derived products

6.3 Planning, construction, operation and closure of a landfill

6.4 Environmental control systems

6.5 Environmental quality monitoring program

7. WASTE SYSTEMS PLANNING AND MANAGEMENT

7.1 Systems planning

7.2 Management systems and instruments

7.3 System performance indicators

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

To provide students with adequate preparation to work within the scope of waste management, recovery and treatment, namely in the implementation and coordination of solid waste management activities at all levels, the curricular unit program includes an approach that begins with a introduction to the topic of waste management and treatment, in chapter II the production and composition of waste is addressed, in chapter III the topic of prevention and reduction, in chapter IV the waste collection and transport systems, in chapter V the recovery and waste treatment, chapter VI deals with waste confinement. Finally, the issue of planning and management of waste systems is addressed.

4. MAIN BIBLIOGRAPHY

Worrell, W.A., Vesilind, P.A., Ludwig, C.; Solid Waste Engineering: A Global Perspective, Cengage Learning, 2016. ISBN 978-1305635203

Martinho, M.G.M. e Gonçalves, M.G.P; Gestão de resíduos, Universidade Aberta, 2002. ISBN: 9789726742968

Levy, J.Q. e Cabeças, A.; Resíduos Sólidos Urbanos - princípios e processos, AEPSA-Associação das Empresas Portuguesas para o Sector do Ambiente, 2008. ISBN: 9799899505901

Tchobanoglous, G., Theisen, H. e Vigil, S.; Integrated Solid Waste Management, McGRAW-HILL International Editions, 1993. ISBN: 978-0071128650

Colecção Ambiente; Gestão e Tratamento de Resíduos, Almedina, 2008. ISBN: 9789724036113.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Theoretical-practical expository method using audiovisual media; Case Study; Monitoring the performance of practical exercises and analysis of results. Support and guidance in carrying out research work. Study visit to an infrastructure for the treatment, recovery and confinement of solid waste. The assessment method: practical work (25%) and frequency (75%) or exam and appeal exam (100%).

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

The theoretical contents of the curricular unit will be transmitted to students through oral presentation supported by audiovisual means. The consolidation and application of these concepts will be achieved through practical exercises and convenient analysis of results. To provide students with autonomy in applying the knowledge learned, they will develop analysis and research work within the scope of waste management and treatment, which will be guided by the subject teacher. With the teaching methodology presented, students will be equipped with the necessary skills to work within the scope of integrated solid waste management and treatment systems.

7. ATTENDANCE

This course has only optional attendance, therefore, attendance at classes is optional.

8. CONTACTSANDOFFICEHOURS

Email: prodrigues@ipg.pt

Office: Laboratory (Labmia)

Opening hours:

Monday (11:30 - 12:30 and 16:30 - 17:30) Thursday (16:00 - 17:00)

Friday (10:30-11:30)

DATE

04 October 2023

SIGNATURES

Professor

(signature)

Area/Group Coordinator

(signature)