

	SUBJECT DESCRIPTION	MODELO PED.013.02
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<i>Course</i>	Computer Engineering			<i>Academic year</i>	2018/2019		
<i>Subject</i>	Network security			ECTS	4		
<i>Type of course</i>	Elective						
<i>Year</i>	2nd and 3rd	<i>Semester</i>	2nd sem	<i>Student Workload:</i>			
<i>Professor(s)</i>	Fernando Melo Rodrigues			<i>Total</i>	60	<i>Contact</i>	45
<i>Scientific area Coordinator</i>	António Martins						

PLANNED

1. LEARNING OBJECTIVES

The aim of this subject is students develop their knowledge in network security. After attending the course the student should know:

- O1.Computer security;
- O2.Network security;
- O3.Network equipment security Hardening
- O4.Audit Computer Systems.

2. PROGRAMME

P1.Introduction to security

- a. Importance of Computer Security
- b. Fundamental concepts
- c. Physical Security and Security Logic
- d. Information Security Policies

P2.– Threats to Computer Security

- a. Types of Threats
- b. Systems of Recognition, Services and Vulnerabilities

- c. Listen Packages
- d. Encroachment IP Address
- e. Hijacking TCP Session
- f. Denial of Service
- g. Social Engineering
- h. Viruses, Worms and Trojan Horses
- i. Vulnerability List

P3.Fundamental concepts about firewalls

- a. Packet Filter
- b. Translation addresses and Ports
- c. Intrusion detection and prevention
- d. Proxies
- e. Virtual Private Networks

P4.Cryptography

- a. Cryptography and Cryptanalysis
- b. Evolution of encryption technology
- c. Cipher Types
- d. Encryption will approximations
- e. Synthesis functions

P5.Packet filters on Cisco routers

- a. Packet Filtering Architecture for Cisco Routers
- b. Sensitive Access Lists Contextual (CBAC)

- c. NAT e PAT services

P6. Authentication

- a. Authentication techniques
- b. Messages Authenticators
- c. Digital Signatures
- d. Security in Wireless Networks

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

The learning objectives 1 (O1) will be achieved by programmer content P1 and P2. Will review the concepts of network architecture (P1) and will present the new paradigms in order to guarantee quality of service (P2). In P3 will be presents IPv6 addresses scheme to fulfill with O2. Learning objectives O3 will be achieved by presenting Switching technologies in P4. Finally, the O5 will be achieved with the introduction of WAN technologies concepts, presented in P6.

4. MAIN BIBLIOGRAPHY

Mandatory:

- B1. Osvando Santos, Firewalls – Soluções Práticas, FCA, ISBN: 978-972-722-688-7, 2011
- B2. Jorge Granjal, Gestão de Sistemas e Redes em Linux, 978-972-722-645-0, 2010
- B3. André Zúquete, Segurança em Redes Informáticas, FCA, ISBN: 972-722-399-0, 2006
- B4. Monteiro, E., Boavida, F., Engenharia de Redes Informáticas 4ª Edição, FCA, Agosto 2000

Optional / Recommended:

- B5. Omar Santos, John Stuppi, " CCNA Security 210-260 Official Cert Guide Premium Edition eBook and Practice Test", Cisco Press 2015

B6. Oliveira, W. Técnicas para Hackers e Soluções de Segurança, Centro Atlântico, 2000

B7. CISCO, "White Paper - The Science of Intrusion Detection System Attack Identification", http://www.Cisco.com/en/US/products/sw/secursw/ps2113/products_white_paper09186a0080092334.shtml, (Julho 2013)

B8. Kazienko, P., Dorosz, P., "Intrusion Detection Systems (IDS) Part I - (network intrusions; attack symptoms; IDS tasks; and IDS architecture)", http://www.windowsecurity.com/articles/Intrusion_Detection_Systems_IDS_Part_I__n_network_intrusions_attack_symptoms_IDS_tasks_and_IDS_architecture.html, (Abril 2013)

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching methodologies:

1. Expositive lecture
2. Individual Search
3. Practical demonstration

Assessment criteria:

Continuous Assessment: The student approves this subject when the weighted average of continuous assessment factors and practical component, is equal to or higher than ten. This Assessment includes:

Two practical assessments (35%): The 1st is a literature synthesis home work with public discussion(155). The 2nd is a practical implementation in network simulator (20%).

A written Assessment (1st / 2nd assessment) (65% - minimum score of 8/20 points).In this assessment are formulated theoretical issues and asked to carry out practical tasks, in order to assess: scientific knowledge and the practical domain.

Final assessment (Recurso): Student who has no evaluating on "continuous Assessment", he or she must do written assessment (100%).

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

1. **Expositive lecture** is used on the objectives O1, O3 and O4 because it will introduce theoretical subjects;
2. In order implement the Bologna agreement methodologies; students will perform an **individual search** on P3 to fulfill O2.
3. Additionally, as reflected by the O4 and O5, will be introduced equipment configurations for what will use **experimental demonstration**.

7. ATTENDANCE

Not applicable

Date: 17 / 6 / 2019

Signature:
Professor,
Fernando Melo Rodrigues

Scientific area Coordinator
António Martins