INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Networks and Systems Security			Field of study	Network and Computer Systems								
Bachelor in	Informatics and Communications			School	School of Public Management, Communication and Tourism								
Academic Year	2023/2024	Year of study	3	Level	1-3	ECTS credits	6.0						
Type	Semestral	Semester	1	Code	9188-320-3104-00-23								
Workload (hours)	162	Contact hours	T 15	TP -	PL 45	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): Luis Paulo Alves dos Santos

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Develop a global vision on the various aspects of security that must be considered to protect as much as possible, the networks and network services;
2. Understand, specify, maintain and evolve, architectures to support;
3. Understand the importance of security in the context of organizations;
4. Identify the vulnerabilities of a particular information system;
5. Understand, explore and implement security technologies;
6. Develop policies and procedures to adequate security on organizations;
7. Set, explore and implement a security architecture appropriate given the specificity of an organization;
8. Make reengineering in the security of systems and networks and computers.

Prerequisites

Before the course unit the learner is expected to be able to:
Have basic knowledge on computer systems and networks.

Course contents

It addressed the issue of security of systems and networks based on the individual and organizational needs, passing by the field of configuration and development of practical solutions that are able to improve security. They also discussed the key technologies to support security such as: Firewall, IDS, Honeypots, VPN, fingerprints and Hash Algorithms or Criptosystems.

Course contents (extended version)

1. Security requirements;
2. Threats and Vulnerabilities;
3. Types of attacks;
4. Intrusion Techniques;
5. Security Mechanisms;
6. Security Architecture;
7. Perimeter security;
8. Security Technologies:
   - Firewall;
   - IDS;
   - Honeypots;
9. VPN;
10. Security Policy;
11. Security Procedures;
12. Fingerprints and Hash Algorithms;
13. Criptosystems;
14. Digital Certificates;
15. Public-key infrastructure;
16. Authentication Systems;
17. Security in wireless networks;
18. Session Security;
19. Applications Security.

Recommended reading

1. BISHOP, M. (2018). Computer Security: Art and Science. (2ª Edição). Editora Addison-Wesley. ISBN: 978-0321712332
2. STALLINGS, W. (2016). Cryptography and Network Security: Principles and Practices. (7ª Edição). Editora Printice Hal. ISBN: 978-0134444284
3. BISHOP, M. (2004). Introduction to Computer Security. (1ª Edição). Editora Addison-Wesley. ISBN: 978-0321247445
4. ZÚQUETE, A. (2018). Segurança em Redes Informáticas. (5ª Edição). Editora FCA. ISBN: 978-972-722-857-7

Teaching and learning methods

Lectures: Presentation and discussion of the matter. Presentation of examples / demos. Laboratorial Practical classes: carrying out the practical application of theoretical concepts presented in class.

Assessment methods

1. continuous evaluation - (Regular, Student Worker) (Final)
   - Intermediate Written Test - 40% (Two written tests. Minimum grade: 7. 0 values)
   - Practical Work - 40% (Minimum grade: 7. 0 values)
   - Laboratory Work - 20% (Minimum grade: 7. 0 values)
2. Final Evaluation - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 40% (Minimum grade: 7. 0 values)
   - Practical Work - 40% (Minimum grade: 7. 0 values)
   - Laboratory Work - 20% (Minimum grade: 7. 0 values)
3. Incoming Students in mobility programs - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 40% (Minimum grade: 7. 0 values)
   - Practical Work - 40% (Minimum grade: 7. 0 values)
   - Laboratory Work - 20% (Minimum grade: 7. 0 values)

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Luis Paulo Alves dos Santos	Vítor José Domingues Mendonça	Anabela Neves Alves de Pinho	Luisa Margarida Barata Lopes
18-10-2023	19-10-2023	19-10-2023	19-10-2023