[MNB101] Infrastructure and Network Security

GENERAL INFORMATION

Studies	MASTER DEGREE IN DATA ANALYSIS, CYBERSECURITY AND CLOUD COMPUTING	**Subject**	Cybersecurity
Semester	1	**Course** 1	**Mention / Field of specialisation**
Character	COMPULSORY		
Plan	2024	**Modality** Face-to-face	**Language** ENGLISH
Credits	6	**Hours/week** 0	**Total hours** 64 class hours + 86 non-class hours = **150 total hours**

PROFESSORS

GARITANO GARITANO, IÑAKI
ITURBE URRETXA, MIKEL

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	Able to install and manage both physical and virtual servers in a network infrastructure. Able to install and manage the GNU/Linux operating system and services on this operating system. Able to install and manage a network of both physical and virtual computers.

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
M2N106 - Recognising the main computer threats and vulnerabilities and designing, developing and implementing existing security countermeasures at the level of infrastructures and networks to address them.		x		5
M2N207 - Apply acquired knowledge and problem-solving skills in new, unfamiliar or changing environments within broader (or multidisciplinary) contexts related to their field of study.		x		0,4
M2N209 - Communicate their conclusions and the ultimate knowledge and reasons behind them to specialist and non-specialist audiences in a clear and unambiguous way.		x		0,6
			Total:	6

KC: Knowledge or Content / SK: Skills / AB: Abilities

SECONDARY LEARNING RESULTS

RA213 Is able to identify, design and implement security mechanisms, individually and in groups.

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	17 h.	15 h.	32 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	12 h.		12 h.
Carrying out exercises and solving problems individually and/or in teams	7 h.	14 h.	21 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	40%
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	60%

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

CH - Class hours: 36 h.
NCH - Non-class hours: 29 h.
TH - Total hours: 65 h.

RA211 Is able to analyze, evaluate and select appropriate security measures to ensure confidentiality, integrity and availability of information in different environments.

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		15 h.	15 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	12 h.	14 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	12 h.		12 h.
Carrying out exercises and solving problems individually and/or in teams	7 h.	12 h.	19 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	40%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	60%	

CH - Class hours: 21 h.
NCH - Non-class hours: 39 h.
TH - Total hours: 60 h.

RA212 **Obtains a thorough knowledge of existing security threats and their impact on operations.**

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		7 h.	7 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	3 h.	5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	5 h.		5 h.
Carrying out exercises and solving problems individually and/or in teams		8 h.	8 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Individual written and/or oral tests or individual coding/programming tests	100%	Individual written and/or oral tests or individual coding/programming tests

CH - Class hours: 7 h.
NCH - Non-class hours: 18 h.
TH - Total hours: 25 h.

CONTENTS

1. Introduction
2. Cryptography
3. Node Security
4. Network Security
    1. Network Protocol Security
    2. Firewalls
    3. VPNs
    4. User identification
5. Attack Detection
    1. Signature-based detection
    2. Anomaly Detection Systems
    3. Attack response
    4. Intrusion/Anomaly detection in industrial environments
    5. SIEM and log analysis

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform Subject notes	http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_lnk.pl?grupo=MASTERDATUANALISIA11&ejecuta=20&