

[MNB003] SOFTWARE SECURITY

GENERAL INFORMATION

Studies	Data Analysis, Cybersecurity and Cloud Computing	Subject	Cybersecurity
Semester	2	Course	1
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2019	Modality	Adapted Face-to-face
Credits	6	Hours/week	0
		Language	ENGLISH
		Total hours	64 class hours + 86 non-class hours = 150 total hours

PROFESSORS

ZURUTUZA ORTEGA, URKO
 ITURBE URRETXA, MIKEL

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	(No previous knowledge required)

SKILLS

VERIFICA SKILLS

SPECIFIC

MNCE08 - Auditing software, using tools that allow the search for security vulnerabilities and being able to support the development of more secure software.

GENERAL

MNCG02 - Using computer tools of cybersecurity new fields of application to solve complex problems and carry out engineering projects while considering the business and industrial context.

CROSS

MNCTR1 - Ability to work in multidisciplinary teams and in a multilingual environment (Basque/Spanish/English) and to communicate, both orally and in writing, knowledge, procedures, results and ideas related to the life cycle of the data, cybersecurity, and development and operations.

BASIC

M_CB6 - To have and understand knowledge which provides a base or opportunity to be original in the development and/or application of ideas, often in an investigation context

LEARNING RESULTS

RA231 The student is able to audit software from a security point of view with the aim of evaluating its robustness and identifying possible failures that may affect the proper functioning of the system

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams		11 h.	11 h.
Individual study and work, tests and evaluations and check points	2 h.	7 h.	9 h.
Classroom presentations of relevant concepts and procedures in participatory environments	12 h.		12 h.
Individual and team solving of exercises, problems, and practices	8 h.	20 h.	28 h.

EVALUATION SYSTEM

	W
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	50%
Written, coding/programming and individual oral tests for the evaluation of technical skills in the field	50%

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject

CH - Class hours: 22 h.

NCH - Non-class hours: 38 h.

TH - Total hours: 60 h.

RA232 The student is able to manage the entire software life cycle from the security point of view to minimize security errors in the software

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams		11 h.	11 h.

Individual study and work, tests and evaluations and check points	2 h.	7 h.	9 h.
Classroom presentations of relevant concepts and procedures in participatory environments	12 h.		12 h.
Individual and team solving of exercises, problems, and practices	8 h.	10 h.	18 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	30%	Individual written and oral tests to assess technical skills of the subject	
Written, coding/programming and individual oral tests for the evaluation of technical skills in the field	70%		
CH - Class hours: 22 h.			
NCH - Non-class hours: 28 h.			
TH - Total hours: 50 h.			

RA233 The student is able to analyse, evaluate, contrast and select the appropriate techniques to increase the security of the software when dealing with problems or projects			
LEARNING ACTIVITIES	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.	16 h.	20 h.	36 h.
Relating to projects/POPBLs carried out individually or in teams			
Classroom presentations of relevant concepts and procedures in participatory environments	4 h.		4 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	100%	Individual written and oral tests to assess technical skills of the subject	
CH - Class hours: 20 h.			
NCH - Non-class hours: 20 h.			
TH - Total hours: 40 h.			

CONTENTS

1. Software vulnerabilities
 1. Binary exploitation
 1. Introduction to Assembler language
 2. Low level vulnerabilities: memory corruption...
 3. Exploitation, Shellcoding
 4. Other vulnerabilities: race conditions etc.
 2. Web security
2. Software analysis and vulnerability discovery
 1. Static analysis
 2. Introduction to reverse engineering
 3. Malware dynamic analysis
3. Software protection
 1. Low-level protection
 2. Application protection and testing (fuzzing, robust programming)

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform	http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_ink.pl?grupo=MASTERDATUANALISIA12&ejecuta=20&
Slides of the subject	
Presentations by external Lecturers	
Class presentations	