Course guide
230996 - SDS - Software-Defined Security (Sds)

Last modified: 26/05/2023

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 701 - DAC - Department of Computer Architecture.

Degree: MASTER'S DEGREE IN CYBERSECURITY (Syllabus 2020). (Optional subject).

Academic year: 2023 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: Consultar aquí / See here: https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura

Others: Consultar aquí / See here: https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma

PRIOR SKILLS

Basic knowledge of communication network concepts.
Basic knowledge of Machine Learning concepts.
Programming skills in Python.

REQUIREMENTS

Knowledge of communication network concepts.
Programming skills in Python.

TEACHING METHODOLOGY

The teaching methodologies employed in this course are:
- Lectures.
- Participative sessions.
- Supervision of practice sessions in the lab.
- Supervision and orientation in teamwork.
- Orientation of autonomous work.
- Personalized tutoring.
- Doubts sessions.

LEARNING OBJECTIVES OF THE SUBJECT

1. Acquisition of the basic theoretical concepts in the field of SDN and AI security.
2. Design and implementation of an SDN-based scenario in a team to solve a security problem.

STUDY LOAD

Type	Hours	Percentage
Hours large group	26,0	20.80
Hours small group	13,0	10.40
Self study	86,0	68.80

Total learning time: 125 h

CONTENTS

Foundations of Virtual Networking and Security

Description:
1. Introduction of Computer Networks and Virtual Networking
2. SDN and NFV
3. Network Security Preliminaries
4. SDN and NFV Security

Full-or-part-time: 41h 39m
Theory classes: 5h
Laboratory classes: 10h
Guided activities: 10h
Self study : 16h 39m

Advanced Topics on Software-Defined and Virtual Network Security

Description:
5. Microsegmentation
6. Moving Target Defense
7. Service Function Chaining

Full-or-part-time: 25h
Theory classes: 3h
Laboratory classes: 6h
Guided activities: 6h
Self study : 10h

AI and Security

Description:
9. Introduction to Machine Learning and Artificial Intelligence
10. Intelligent Software-Defined Security and AI Security

Full-or-part-time: 8h 20m
Theory classes: 1h
Laboratory classes: 2h
Guided activities: 2h
Self study : 3h 20m

Project

Description:
Project development, presentation, and demonstration

Full-or-part-time: 33h 20m
Guided activities: 12h
Self study : 21h 20m

GRADING SYSTEM

Laboratories: 20%
Participation: 20%
Practical exercise developed in teams: 60%.
It is required to complete the practical exercise to pass the course.

BIBLIOGRAPHY

Basic:
- Huang, D.; Chowdhary, A; Pisharody, S. Software-defined networking and security: from theory to practice. Boca Raton, FL: CRC Press/Taylor & Francis Group, 2019. ISBN 9780815381143.