Course guides
230996 - 5GSFN - Securing 5G Fixed Network

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: 2021 ECTS Credits: 5.0 Languages: English

LECTURER

Coordinating lecturer: Velasco Esteban, Luis Domingo
Others:

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>86,0</td>
<td>68.80</td>
</tr>
<tr>
<td>Hours small group</td>
<td>13,0</td>
<td>10.40</td>
</tr>
<tr>
<td>Hours large group</td>
<td>26,0</td>
<td>20.80</td>
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</tbody>
</table>

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: