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

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: 2022  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

<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>
</tr>
</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

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**GRADING SYSTEM**

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

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**BIBLIOGRAPHY**

**Basic:**  