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: 2020   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 Java and Python.

REQUIREMENTS
This subject has not requirements

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>
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</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>26,0</td>
<td>20.80</td>
</tr>
<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>
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</tbody>
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Total learning time: 125 h
CONTENTS

Foundations of Virtual Networking and Security

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

Full-or-part-time: 7h
Theory classes: 5h
Guided activities: 2h

Advanced Topics on Software-Defined and Virtual Network Security

Description:
6. Microsegmentation
7. Moving Target Defense
8. Attack Representation
9. Service Function Chaining
10. Security Policy Management in Distributed SDN Environments
11. Intelligent Software-Defined Security

Full-or-part-time: 26h
Theory classes: 20h
Laboratory classes: 6h

AI Security

Description:
12. Introduction to Machine Learning and Artificial Intelligence
13. AI Security

Full-or-part-time: 7h
Theory classes: 5h
Laboratory classes: 2h

ACTIVITIES

Theoretical lectures covering the content of the course

Description:
Contents:
1. Foundations of Virtual Networking and Security
2. Advanced Topics on Software-Defined and Virtual Network Security
3. Secure AI

Full-or-part-time: 30h
Theory classes: 30h
Work sessions in the computer lab

Description:
Contents:
1. Foundations of Virtual Networking and Security
2. Advanced Topics on Software-Defined and Virtual Network Security

Full-or-part-time: 10h
Laboratory classes: 10h

Exam of the theoretical content of the course

Description:
final exam

Full-or-part-time: 40h
Self study: 40h

Practical exercise

Description:
lab exam

Full-or-part-time: 45h
Guided activities: 5h
Self study: 40h

GRADING SYSTEM

Final exam: 40%
Practical exercise developed in teams: 60%.
It is required to complete the practical exercise to pass the course.

BIBLIOGRAPHY

Basic: