

Course Title	Communications and Network Security				
Course Code	CYS615				
Course Type	Compulsory				
Level	Master (2 <sup>nd</sup> cycle)				
Year / Semester	1 <sup>st</sup> Year/1 <sup>st</sup> Semester				
Teacher's Name	TBA				
ECTS	10	Lectures / week	None	Laboratories / week	None
Course Purpose and Objectives	This course introduces fundamental concepts of communications and network security, particularly in the context of internal and external threats to the operation of the network and to the devices that are attached to it.				
Learning Outcomes	<p>Upon successful completion of this course students should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the underlying principles of networking layers, architecture, topologies, protocol stacks, and separation of duties.</li> <li>• Explain the basic types of networking device, both logical and physical.</li> <li>• Analyse networking methods and applications in practical systems.</li> <li>• Classify and describe different types of wired network attacks.</li> <li>• Classify and describe different types of wireless network attacks.</li> <li>• Describe and evaluate methods and devices used to protect networks.</li> </ul>				
Prerequisites	None		Co-requisites	CYS600	
Course Content	<p><u>Introduction:</u> Refresh on fundamental networking principles and devices, OSI and TCP/IP models. Different types of networking areas – WAN, LAN, MAN, PAN, wireless and mobile systems.</p> <p><u>Principles:</u> the network as a route for cyberattacks, how the network can be protected, vulnerabilities, threats.</p> <p><u>Network Attacks:</u> scanning, malware, (D)DoS, route poisoning, MAC spoofing, sniffing, authentication attacks, man-in-the-middle, session takeover, wiretaps, MAC table flooding, ARP poisoning, ICMP attacks, DNS poisoning, smurf and fraggle attacks, phishing, spam, war-dialling, methods to prevent the network attacks that have been covered (within the discussion of each attack type).</p> <p><u>Wireless Attacks:</u> Encryption and key management vulnerabilities, wireless sniffing, war-driving, mobile/cellular cell spoofing, eavesdropping, mobile phone attacks, methods to prevent the network attacks that have been covered (within the discussion of each attack type).</p>				

	<p><u>General protection, prevention and detection:</u> Firewalls and packet filtering, demilitarized zones (DMZ), intrusion detection and prevention systems, IPsec, VLANs and network zoning, MAC access control, network authentication, system hardening, encryption, authentication, universal threat management (UTM), web filtering, honeypots, awareness.</p> <p><u>Cloud security</u> - definitions pertinent to cloud computing, identify risks, and delve into a security architecture, data protection, access management, monitoring, compliance, and emerging trends.</p> <p>Network management as an effective information-gathering tool and starting point for comprehensive protection mechanisms, use of network and asset management tools to ensure uniform conformity to relevant cybersecurity standards and policies.</p> <p>Business case study and lecture: Lecture by invited experts from the cybersecurity industry. Discussion normally focuses on usual network attacks and methods for protection.</p>						
Teaching Methodology	<p>E-Learning</p> <p>As this course has a major practical component, a major part of the student workload is based on participating and completing online lab exercises.</p>						
Bibliography	<p><i>“Computer Networking: A Top-Down Approach, by Jim Kurose and Keith Ross.</i></p> <p><i>“Guide to Computer Network Security”, by Joseph Migga Kizza</i></p> <p><i>“Network Security Essentials: Applications and Standards”, by William Stallings</i></p>						
Assessment	<table border="1" data-bbox="459 1261 1177 1375"> <tr> <td data-bbox="459 1261 975 1301">Examinations</td> <td data-bbox="975 1261 1177 1301">50%</td> </tr> <tr> <td data-bbox="459 1301 975 1341">Assignments/On-going evaluation</td> <td data-bbox="975 1301 1177 1341">50%</td> </tr> <tr> <td data-bbox="459 1341 975 1375"></td> <td data-bbox="975 1341 1177 1375">100%</td> </tr> </table>	Examinations	50%	Assignments/On-going evaluation	50%		100%
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	100%						
Language	English						