RTU Course "Network Security Requirements"

33000 Datorzinātnes, informācijas tehnoloģijas un enerģētikas fakultāte

General data

Code	DE0748
Course title	Network Security Requirements
Course status in the programme	Compulsory/Courses of Limited Choice; Courses of Free Choice
Responsible instructor	Mārīte Kirikova
Academic staff	Jens Myrup Pedersen Aigars Rieksti̦ņš
Volume of the course: parts and credits points	1 part3.0 ECTS credits
Language of instruction	LV, EN
Possibility of distance learning	Planned
Abstract	The study course introduces students to cybercrime and different kinds of attacks and malware types, botnets, basic tools and methods for network monitoring and network traffic analysis, as well as methods for detecting and preventing network-based attacks. It also includes the introduction to penetration testing tools. The study course is prepared and delivered by professor Jens Myrup Pedersen, Aalborg University, Denmark. The network security educational platform developed at Aalborg University is used in the study course.
Goals and objectives of the course in terms of competences and skills	The goal of the study course is to provide the students with an overview of the most important aspects of network security. The tasks of the study course: 1. To provide students with an understanding of cybercrime and the most important attacks that the industry experiences today, including the motivations and techniques behind them. 2. To enable students to use and choose basic tools and methods for monitoring network traffic, as well as tools and methods for subsequent analysis. 3. To help to develop an understanding of the approaches to and methods for detecting and preventing network-based attacks. 4. To introduce students to penetration testing tools.
Structure and tasks of independent studies	Independent studies are integrated with theoretical and practical classes. According to the material given in the theory and using additional resources, students should develop mini-projects and perform other tasks in identifying security risks and examining security requirements.
Recommended literature	Obligātā/Obligatory: Joseph Migga Kizza, Guide to Computer Network Security, Springer 2020. Papildu/Additional: 1. Oppliger, Rolf. Secure messaging on the internet / Rolf Oppliger. Norwood, MA: Artech House, ©2014., xv, 265 lpp.: il. 2. Perez, André. Network security / Andre Perez. Hoboken, NJ: ISTE Ltd/John Wiley and Sons Inc, ©2014., xxxix, 262 lpp.: il.
Course prerequisites	Computer networks basics.

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Introduction: Cyber crime and different kinds of attacks and malware types.	3	4	0	0
Network based threats, e.g., network scanning, covert channels, steganography.	5	8	0	0
Botnets.	5	6	0	0
Basic tools for network monitoring.	5	8	0	0
Basic tools and methods for network traffic analysis.	5	8	0	0
Methods for detecting and preventing network-based attacks.	4	6	0	0
Introduction to penetration testing tools.	5	8	0	0
Total:	32	48	0	0

Learning outcomes and assessment

Learning outcomes	Learning outcomes assessment methods and assessment criteria
Is able to apply basic techniques for network monitoring and analysis and to evaluate which techniques can be used to solve given problems.	Performed practical exercises.
Knows network-based threats and botnets, and tools for detecting and preventing such.	Exam with theoretical and practical parts.
Is able to analyse examples of network-based attacks.	Performed practical exercises.
Is able to evaluate which methods and tools for detecting and preventing network-based attacks should be used for a specific case/problem.	Performed practical exercises.
Knows selected methods and tools for penetration testing.	Performed practical exercises.

Course tests

Tests	% of final assessment
Individual practical exercises	50
Exam	50
Total:	100

Course planning

Part	Semester			CP	Academic hours			Tests			Tests (free choice)		
	Autumn	Spring	Summer		Lectures	Practical	Lab.	Test	Exam	Work	Test	Exam	Work
1.	*			3.0	16.0	16.0	0.0		*			*	