Valid from 2025.FS

Module description: IT-Security

Module Code	w.BA.XX.3ITSe-WIN.XX
ECTS Credits	6
Language of Instruction/Examination	English
Module Description	This course provides the necessary basic knowledge on information and cyber security topics. Initially, this also includes a sound introduction to computer networks. Starting with communication in switched Ethernet networks and the various protocols and layers (TCP/IP), we also look at basic services and architectures of the internet. Equipped with these basics, we work together to develop an understanding of real threats and vulnerabilities in modern IT infrastructures, learn how to assess them, and evaluate suitable protection concepts. In addition to concepts for protection, the necessary knowledge about the detection of incidents and the handling of attacks that have already occurred is also taught. In parallel to the lectures, practical exercises are held in which all topics are then applied. We work mainly with virtualized/simulated environments.
Organizational Unit	Institut für Wirtschaftsinformatik
Module Coordinator	Tibor Dudas
Deputy Module Coordinator	Christian Weber
Program and Specialization	• Business Information Technology - Specialization in Business Information Systems • Business Information Technology - Specialization in Data Science
Legal Framework	Academic Regulations BSc dated 29.01.2009, for the degree programs in Business Administration, International Management, Business Information Technology, Business Law, Business Law and Applied Law, first adopted on 12.05.2009
Module Category	**Module Type** Compulsory **Program Phase** First Year-Studies
Prerequisite Knowledge	
Contribution to Program Learning Objectives (by the concerned Module)	• Professional Competence • Methodological Competence • Social Competence • Self-Competence
Contribution to Program Learning Objectives	**Professional Competence** • Knowing and Understanding Content of Theoretical and Practical Relevance • Apply, Analyze, and Synthesize Content of Theoretical and Practical Relevance • Evaluate Content of Theoretical and Practical Relevance **Methodological Competence** • Problem-Solving & Critical Thinking • Work Methods, Techniques, and Procedures • Information Literacy • Creativity & Innovation **Social Competence** • Written Communication • Oral Communication • Teamwork & Conflict Management • Intercultural Insight & Ability to Change Perspective **Self-Competence** • Self-Management & Self-Reflection • Ethical & Social Responsibility • Learning & Change

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Module Learning Objectives

Students...
- understand computer networks and communication concepts.
- configure secure small networks (home network or small SMEs).
- conceptually understand internet services (HTTP, DNS, SMTP), typical infrastructure services (DHCP/BootP), and protocols like ARP, IP, TCP, and UDP.
- implement simple routing and firewall rules with the Linux netfilter.
- learn about important threats, protection, and recovery strategies.
- gain entry level knowledge of cryptographic protocols, forensics, and data recovery procedures.

Module Content

- OSI- TCP/IP-Model / Layer_1_2_PHY_MAC_Gigabit_Switched_Ethernet
- Layer_3_Network_IPv4_IPv6_Addressing_Routing_CIDR
- Layer_4_Transport_TCP_UDP_(ICMP)
- Layer_5-7_Applications_DNS_DHCP_HTTP_SMTP
- Computer network security fundamentals
- Security threats/vulnerabilities/hackers
- Security assessment, analysis, and assurance
- Disaster management
- Cryptography
- Access Control, autorization, and authentication
- Firewalling
- Intrusion detection/forensics/virus & content filtering

Links to other modules

This module is linked to the following modules:

Digital Learning Resources

- Multiple Choice Tests

Methods of Instruction

- Lecture
- Exercises
- Explorative Learning
- Interactive Instruction

Social Settings Used:
- Pair Work
- Individual Work

Type of Instruction

	Classroom Instruction	Guided Self-Study	Autonomous Self-Study
Large Class	28 h	12 h	
Small Class	28 h	56 h	
Group Instruction	-	-	
Practical Work	-	-	
Seminar	-	-	
Total	**56 h**	**68 h**	**56 h**

Performance Assessment

End-of-module exam	Form	Length (min.)	Weighting
Written exam	open book	90	100.00
Permitted Resources	Free choice calculator	With dictionary	

Others	Assessment	Format	Length (min.)	Weighting
10 Moodle tests (during the semester)	Pass/Fail	Einzelarbeit	5	0.00

Classroom Attendance Requirement

None

Compulsory Reading

- Guide to Computer Network Security, https://link.springer.com/book/10.1007/978-3-030-38141-7
- Computer Networks / Computernetze Bilingual Edition: English – German / Zweisprachige Ausgabe: Englisch – Deutsch https://link.springer.com/book/10.1007/978-3-658-26356-0

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Recommended Reading	
Comments	