Module title | Security of Software Systems  
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Abbreviation | 10-I=SSS-172-m01  

Module coordinator | holder of the Chair of Computer Science (Secure Software Systems)  
Module offered by | Institute of Computer Science  

ECTS | Method of grading | Only after succ. compl. of module(s)  
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5 | numerical grade | --  

Duration | Module level | Other prerequisites  
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1 semester | undergraduate | --  

Contents  
The lecture provides an overview of common software vulnerabilities, state-of-the-art attack techniques on modern computer systems, as well as the measures implemented to protect against these attacks. In the course, the following topics are discussed:  
- x86-64 instruction set architecture and assembly language  
- Runtime attacks (code injection, code reuse, defenses)  
- Web security  
- Blockchains and smart contracts  
- Side-channel attacks  
- Hardware security  

Intended learning outcomes  
Students gain a deep understanding of software security, from hardware and low-level attacks to modern concepts such as blockchains. The lecture prepares for research in the area of security and privacy, while the exercises allow students to gain hands-on experience with attacks and analysis of systems from an attacker’s perspective.  

Courses (type, number of weekly contact hours, language — if other than German)  
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Module taught in: English  

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)  
written examination (approx. 60 to 120 minutes).  
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).  
Language of assessment: English  
creditable for bonus  

Allocation of places  
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Additional information  
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): SE, IS, LR, HCI, ES.  
Basic programming knowledge in C is required.  

Referral to LPO I (examination regulations for teaching-degree programmes)  
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Module appears in  
Master’s degree (1 major) Computer Science (2017)  
Master’s degree (1 major) Computer Science (2018)  
Module studies (Master) Computer Science (2019)
Master's degree (1 major) Computational Mathematics (2019)
Master's degree (1 major) Mathematics (2019)
Master's degree (1 major) (2019)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)