Blockchain

26HS

Programme	BSc in Wirtschaftsinformatik BSc in Business Information Technology
Degree	Bachelor
ECTS	3
Module coordinator	Prof. Dr. Walter Dettling
Compulsory attendance	Attendance during the block week is mandatory(85%)
Leading principle / Short description	This module gives students a practical introduction to the world of blockchain technologies. By combining theoretical knowledge with practical exercises, the central concepts are explained in an understandable and application-oriented way. Playful discovery with Bloxxgame and practical exercises with real wallets and decentralised applications are a major part of the program.
Module content	**Cryptographic basics:** o Secure Hash o Asymmetric encryption o Electronic Signatures **Blockchain mechanisms:** o Structure of a Blockchain o UTXO and account-based ledgers o Creating and sending blockchain transactions o Verifying and confirming transactions and blocks o Crypto Mining o Smart contracts o Proof of Work o Proof of Stake o Web 3 Architecture **Decentralised Finance (DEFI):** o Crypto Currencies: Bitcoin, Ethereum, Cardano o Centralised and decentralised crypto exchanges **Web 3 Applications:** o Decentralized Crypto Exchanges o NFT Exchanges o Future trends **Economic contexts** o History of Bitcoin, Ethereum and Cardano o Cryptocurrencies in the global financial system
Competencies to be achieved	**Knowledge and Understanding:** Students will understand the following basics of blockchain technology: o Difference between centralised and distributed transaction systems o Cryptographic basics o Functionality of Proof of Work and Proof of Stake o Different types of crypto tokens: : Native Token, Fungible- and Non-Fungible Token o The functioning and role of smart contracts **Application of knowledge and understanding:** Students learn with bloxxgame: o Execute blockchain transactions with a wallet o Build blockchain blocks and generate new crypto coins o Set up and restore crypto wallet o Use decentralised applications **Judgement:** Students will be able to ... o Assess the advantages and disadvantages of blockchain for electronic payment transactions. o Understand and assess crypto-assets. o Understand future developments in decentralized applications (Web 3.0) **Communicative skills:** o Students acquire an understanding of the Blockchain vocabulary and are able to express themselves in a qualified manner. **Self-learning skills:** Students are able to request targeted support for complex issues.
Prerequisites	none

Teaching and learning methods

The module is conducted as a block course.

- Lectures and teaching talks.
- Videos
- Intensive use of Bloxxgame for consolidation and practical application.
- Small groups
- Practical exercises online
- Each participant needs a laptop.

Literature

Literature

Recommended Reading:

- Nakamoto S (2008) Bitcoin : A Peer-to-Peer Electronic Cash System.
- Schär F., Berentsen A.(2020): Bitcoin, Blockchain, and Crypto Assets: A Comprehensive Introduction.
- https://learn.academy.cardanofoundation.org
- https://bloxxgame.io/

Other reading material and documents will be made available on Moodle.

Remarks

Most course materials (slides, videos, literature) and language of instruction is English.

Grading

pass / fail

Assessment

Online practice Test with Bloxxgame 100%	
Oral / Written	Written
Duration (min)	1-2 hours
Timeframe	One week after course
Grading Scale	pass / fail

Module details

Blockchain (CW 33) - Mon - Basel	
Language	Englisch
Max. participants	35
Periodicity	Block week
Lecturers	Prof. Dr. Walter Dettling
Number	2-26HS.W-B-WIBIT-BloC_en.EN/WM