ROBERT GORDON UNIVERSITY ABERDEEN

MODULE DESCRIPTOR

Module Title

Introduction to Blockchain

Reference	CM3402	Version	1
Created	March 2022	SCQF Level	SCQF 9
Approved	July 2022	SCQF Points	15
Amended		ECTS Points	7.5

Aims of Module

To enable students to explore the world of blockchain technology and its applications in industry and financial services.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Analyse the concepts and techniques used in blockchain and cryptocurrencies.
2	Analyse the use of smart contract platforms in industry.
3	Analyse the privacy, security and financial risks related to crypto assets.
4	Critically appraise the global impact of blockchain and crypto assets and their value for business.

Indicative Module Content

Properties of money, history of digital currencies, distributed ledger, the origin of Bitcoin. Proof of Work mining, hash functions, history of development of mining equipment. The mempool(s), fee markets, transactions priority. Gentle introduction to public key cryptography, inputs/outputs/UTXOs, address formats, block explorers. Function of wallets as a keystore, Full nodes vs SPV, hardware wallets, insecure and obsolete wallet types and their weaknesses (security issues), BIP-39 wallets and key backup, extended public key (xpub). Altcoins and smart contract platforms. The Ethereum virtual machine (EVM), gas model of fees, ERC-20 fungible tokens, ERC-721 non-fungible tokens, decentralised autonomous organizations (DAO). Centralized exchanges (CEXs), volatility market risk, DeFi - decentralized exchanges (DEXs), collateralised lending, liquidation risk, arbitrage. Private blockchains, supply chain tracking, blockchain in finance/remittance, electronic voting, crowdfunding ICOs. Regulatory compliance, income & capital gains tax, utility tokens vs securities and ICOs. Phishing and other scams. Environmental impact of Proof of Work, asset inheritance planning. Future of Blockchain: Proof of Stake (PoS), second layer payment networks, privacy enhancements.

Module Ref:	CM3402 v1

Module Delivery

The module is delivered using a combination of online self-study materials, directed reading and activities and supported using virtual workshops and tutor support.

Indicative Student Workload	Full Time	Part Time
Contact Hours	24	N/A
Non-Contact Hours	126	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	100%	Outcomes Assessed:	1, 2, 3, 4
Description:	Portfolio (online quizzes and report).				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The calculation of the overall grade for this module is based on 100% weighting of C1. An overall minimum grade D is required to pass the module.

Module Grade	Minimum Requirements to achieve Module Grade:
A	The student needs to achieve an A in Component 1.
B	The student needs to achieve a B in Component 1.
C	The student needs to achieve a C in Component 1.
D	The student needs to achieve a D in Component 1.
E	The student needs to achieve an E in Component 1.
F	The student needs to achieve an F in Component 1.
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

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INDICATIVE BIBLIOGRAPHY

1	LEWIS, A. 2018. The Basics of Bitcoins and Blockchains: An Introduction to Cryptocurrencies and the Technology that Powers Them. Mango.
2	CASEY M.J. 2019. The Truth Machine: The Blockchain and the Future of Everything. Picador.
3	TAPSCOTT, D. 2016. Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World. Penguin Random House.
4	BASHIR,I. 2018. Mastering blockchain: distributed ledger technology, decentralization, and smart contracts explained. Packt Publishing.
5	ANTONOPOULOS, A. M., 2018. Mastering Ethereum: Building Smart Contracts and DApps. O'Reilly.
6	ANTONOPOULOS, A. M., 2017. Mastering Bitcoin: Programming the Open Blockchain. O'Reilly.