

H8BCAPD1: Blockchain Application Development 1

Module Code:	H8BCAPD1
Long Title	Blockchain Application Development 1 APPROVED
Title	Blockchain Application Development 1
Module Level:	LEVEL 8
EQF Level:	6
EHEA Level:	First Cycle
Credits:	5
Module Coordinator:	
Module Author:	Alex Courtney
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	MSc degree in Computer Science. Experience Lecturing, work experience or projects in the specific domain.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
LO1	Investigate the technical workings of Blockchain Technologies
LO2	Develop and gain exposure to Distributed Applications on Blockchain Infrastructures
LO3	Investigate possible use cases , new and existing for applications on Blockchain
LO4	Develop and Devise a Blockchain Application its infrastructure and implementation
Dependencies	
Module Recommendations	
No recommendations listed	
Co-requisite Modules	
No Co-requisite modules listed	
Entry requirements	Learners should have attained the knowledge, skills and competence gained from stage 3 of the BSc (Hons) in Computing.

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Module Content & Assessment			
Indicative Content			
Blockchain Variations Architecture Review. Generic Elements of a Blockchain. How a Blockchain Works. Benefits and Limitations			
Types of Blockchain Distributed Ledger Technology. Public & Private Blockchain. Semiprivate. Side chains. Permission Ledgers. Tokenized Blockchain			
Decentralization Decentralization using Blockchain. Methods and Routes to Decentralization. Decentralized Organizations. Platforms for Decentralization. Ethereum / Madsafe / Lisk			
Introducing Bitcoin Overview of the Bitcoin system. The Bitcoin P2P network - Sending Payments. Bitcoin Transactions - Life Cycle. Types of Transactions. Fees			
Bitcoin Network & Payments The Bitcoin Network. The Wallets. Bitcoin Payments. Innovation in Bitcoin. Bitcoin Clients & APIs - Setting up a Node and Clients. Testnet. Bitcoin Limitations			
Alternative Coins & Foundations Proofs of Works. Stakes.. Difficulty Algorithms. Namecoin. Litecoin. Primecoin. Zcash. ICOs & ERC20			
Introducing Ethereum & Smart Contracts The Ethereum Network. Components of the Ethereum Eco System. Programming Languages - Runtime. Genesis. Gas. Mining. Wallets and Client Software's. Smart Contracts			
The Ethereum Development Environment Test Networks. Setting up a private Net. Development Tools and Frameworks.. MetaMask. Ganache. Truffle.. Solidity - Value Types / Arrays / Variables			
Introducing Web3 Smart Contract Deployment. HTML & JavaScript Frontend. Development Frameworks - Truffle. IPFS - Decentralized Storage			
Current Landscape What's Next / Emerging Trends. Limitations & Challenges. Blockchain Research			
Assessment Breakdown			%
Coursework			50.00%
End of Module Assessment			50.00%
Assessments			
Full Time			
Coursework			
Assessment Type:	430	% of total:	0
Assessment Date:	n/a	Outcome addressed:	
Non-Marked:	No		
Assessment Description: n/a			
Assessment Type:	Formative Assessment	% of total:	Non-Marked
Assessment Date:	n/a	Outcome addressed:	1,2,3,4
Non-Marked:	Yes		
Assessment Description: Formative assessment will be provided on the in-class individual or group activities.			
Assessment Type:	Continuous Assessment	% of total:	50
Assessment Date:	n/a	Outcome addressed:	1,2,3,4
Non-Marked:	No		
Assessment Description: This will encompass the use of solidity coding language for the Ethereum Blockchain Infrastructure as well as the development of a proficient front end using a platform of choosing e.g. Web3 js / Ruby on Rails / ASP.Net			
End of Module Assessment			
Assessment Type:	Terminal Exam	% of total:	50
Assessment Date:	End-of-Semester	Outcome addressed:	1,2,3
Non-Marked:	No		
Assessment Description: Covering Theoretical aspects of Topic			
No Workplace Assessment			
Reassessment Requirement			
Repeat examination Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.			
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Module Workload				
Module Target Workload Hours 0 Hours				
Workload: Full Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Classroom & Demonstrations (hours)	24	Per Semester	2.00
Tutorial	Other hours (Practical/Tutorial)	24	Per Semester	2.00
Independent Learning	Independent learning (hours)	77	Per Semester	6.42
Total Weekly Contact Hours				4.00

Module Resources	
<i>Recommended Book Resources</i>	
<p>Andreas M. Antonopoulos, Gavin Wood. (2018), Mastering Ethereum, O'Reilly Media, p.384, [ISBN: 9781491971949].</p> <p>Andreas M. Antonopoulos. (2016), Mastering Bitcoin, O'Reilly Media, p.330, [ISBN: 9781491954386].</p> <p>Buterin, V. (0), Ethereum White Paper: A next-generation smart contract and decentralized application platform, Ethereum White Paper, https://github.com/ethereum/wiki/wiki/White-Paper.</p> <p>Bitcoin: A Peer-to-Peer Electronic Cash System. (0), Bitcoin White Paper, https://bitcoin.org/bitcoin.pdf.</p> <p>Hal Finney.. (2004), , Reusable PoW, https://cryptome.org/rpow.</p> <p>Wei Dai. (0), B-Money, http://www.weidai.com/bmoney.txt.</p> <p>Eric Hughes.. (1993), , A Cypherpunk's Manifesto, https://www.net/cypherpunk/manifesto, activism.</p> <p>Dr Adam Back.. (1997), , Hashcash, http://www.org/papers/announce, hashcash.</p>	
<i>Supplementary Book Resources</i>	
<p>Igor Pejic. (2019), Blockchain Babel, Kogan Page, p.288, [ISBN: 978-0749484163].</p> <p>Imran Bashir. Mastering Blockchain, [ISBN: 978-1788839044].</p> <p>Article/Paper List.</p> <p>Type.</p> <p>Item.</p>	
<i>This module does not have any article/paper resources</i>	
<i>This module does not have any other resources</i>	
Discussion Note:	