

H8BCAPD2: Blockchain Application Development 2

Module Code:	H8BCAPD2
Long Title	Blockchain Application Development 2 APPROVED
Title	Blockchain Application Development 2
Module Level:	LEVEL 8
EQF Level:	6
EHEA Level:	First Cycle
Credits:	10
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	Identify and clearly define Blockchain Development platforms
LO2	Perform Business Requirements Analysis for Blockchain Application Development
LO3	Distinguish key functionalities required for a secure Distributed Application
LO4	Develop a Blockchain Infrastructure and a corresponding deployed Blockchain application
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			
Development Tools and Frameworks for Blockchain Compilers. Integrated Development Environments. Tools and Libraries. Ganache. MetaMask. Truffle. Contract Development and Deployment			
Languages for Blockchain Python / Solidity / Web3 / HTML / JS			
Hyperledger Fabric / Sawtooth Lake / Iroha / Burrow / Indy / Explorer. Cello / Composer / Quilt. A Reference Architecture : Privacy and Confidentiality / Scalability / Identity / Auditability / Interoperability			
Scalability and Other Challenges Networks / Consensus / Block Size / Sharding / Side Chains			
Privacy & Confidentiality Obfuscation / Homomorphic Encryption / Hardware Privacy. Confidential Transactions. Security / Smart Contract Security			
Notable Blockchain Projects ZCash / Solidus / Hawk / Casper / Bitcoin-NG / Cello. EOS / Corda / Cardano			
Blockchain Research Smart Contracts / Centralization Issues / Limitations			
Project Development Idea Generation. Business Requirements Analysis. SSDLC. TDD. Marketing & Communications. How to Document your Development. Troubleshooting. Demonstration & Presentations			
Assessment Breakdown			%
Coursework			100.00%
Assessments			
Full Time			
Coursework			
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:	40
Assessment Date:	n/a	Outcome addressed:	1,2,3,4
Non-Marked:	No		
Assessment Description: Market Research & Requirements Analysis Students will be required to identify within the existing blockchain domain a niches or market domain which could benefit from a blockchain based application. Justification for domain should be provided based upon market research. Requirements analysis lifecycle should then be provided further outlining the scope of the project.			
Assessment Type:	Continuous Assessment	% of total:	60
Assessment Date:	n/a	Outcome addressed:	1,2,3,4
Non-Marked:	No		
Assessment Description: Students will be required to perform a rollout of a Blockchain based application, encompassing :- Selection of Development technology- Build and Testing of the Application- Deployment of a Blockchain Infrastructure- Deployment, testing and interaction with the Developed Application Build, Test and Deploy a complex Blockchain Based Application: This should entail :- Requirements Analysis - Selection of Development Tools - Front End Interface - RoR / Java / Web3 - Selection of Blockchain e.g. Hyper / Ether			
No End of Module Assessment			
No Workplace Assessment			
Reassessment Requirement			
Repeat examination <i>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.</i>			
Reassessment Description Repeat failed items The student must repeat any item failed Learning Environment Learning will take place in a classroom/lab environment with access IT resources. Learners will have access to library resources, both physical and electronic and to faculty outside of the classroom where required. Module materials will be placed on Moodle, the College's virtual learning environment			

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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	Every Week	24.00
Tutorial	Other hours (Practical/Tutorial)	24	Every Week	24.00
Independent Learning	Independent learning (hours)	202	Every Week	202.00
Total Weekly Contact Hours				48.00

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: 978-1491954386].</p>	
<i>Supplementary Book Resources</i>	
<p>Imran Bashir. (2018), Mastering Blockchain, 2nd Edition. Packt Publishing, [ISBN: 978-1788839044].</p>	
<i>Recommended Article/Paper Resources</i>	
<p>Hal Finney. (2004), Reusable, https://cryptome.org/rpow.htm</p> <p>Wei Dai.. B-Money, http://www.weidai.com/bmoney.txt</p> <p>Eric Hughes. (1993), A Cypherpunk's Manifesto,, https://www.activism.net/cypherpunk/mani_festo.html</p> <p>Adam Back. (1997), Hash Cash, http://www.hashcash.org/papers/announce.txt</p> <p>Buterin, V.. Ethereum White Paper: A next-generation smart contract and decentralized application platform, https://github.com/ethereum/wiki/wiki/White-Paper</p> <p>Bitcoin White Paper. Bitcoin: A Peer-to-Peer Electronic Cash System,, https://bitcoin.org/bitcoin.pdf</p>	
<i>Other Resources</i>	
<p>[Website], Blockchain White Papers Notes, s, https://hackernoon.com/whitepaper-in-four-minutes-ripple-a27103e4d265</p> <p>[Website], Coinbase, https://www.coinbase.com/</p> <p>[Website], Coindesk, https://www.coindesk.com/</p> <p>[Website], IBM Hyperledger, https://www.ibm.com/blockchain/hyperledger</p> <p>[Website], Metamask, https://metamask.io/</p> <p>[Website], Etherscan, https://etherscan.io/</p> <p>[Website], Ethereum, https://www.ethereum.org/</p>	
Discussion Note:	