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

On successful completion of this module the learner will be able to:

#	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 Compliers. 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 AnalysisStudents 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 ApplicationBuild, 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
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.

Reassessment Description
Repeat failed items The student must repeat any item failed Learning EnvironmentLearning 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

Recommended Book Resources

Andreas M. Antonopoulos,Gavin Wood. (2018), Mastering Ethereum, O'Reilly Media, p.384, [ISBN: 9781491971949].

Andreas M. Antonopoulos. (2016), Mastering Bitcoin, O'Reilly Media, p.330, [ISBN: 978-1491954386].

Supplementary Book Resources

Imran Bashir. (2018), Mastering Blockchain, 2nd Edition. Packt Publishing, [ISBN: 978-1788839044].

Recommended Article/Paper Resources

Hal Finney. (2004), Reusable,
https://cryptome.org/rpow.htm

Wei Dai.. B-Money,
http://www.weidai.com/bmoney.txt

Eric Hughes. (1993), A Cypherpunk's Manifesto,,
https://www.activism.net/cypherpunk/mani festo.html

Adam Back. (1997), Hash Cash,
http://www.hashcash.org/papers/announce. txt

Buterin, V.. Ethereum White Paper: A next-generation smart contract and decentralized application platform,
https://github.com/ethereum/wiki/wiki/Wh ite-Paper

Bitcoin White Paper. Bitcoin: A Peer-to-Peer Electronic Cash System,,
https://bitcoin.org/bitcoin.pdf

Other Resources

[Website], Blockchain White Papers Notes,
s, https://hackernoon.com/whitepaper-in-fou r-minutes-ripple-a27103e4d265

[Website], Coinbase,
https://www.coinbase.com/

[Website], Coindesk,
https://www.coindesk.com/

[Website], IBM Hyperledger,
https://www.ibm.com/blockchain/hyperledg er

[Website], Metamask,
https://metamask.io/

[Website], Etherscan,
https://etherscan.io/

[Website], Ethereum,
https://www.ethereum.org/

Discussion Note:	