H8EFC: Edge and Fog Computing

Module Code:		H8EFC					
Long Title		Edge and Fog Computing APPROVED					
Title		Edge and Fog Computing					
Module Level:		LEVEL 8					
EQF Level:		6					
EHEA Level:		First Cycle					
Credits:		5					
Module Coordinator:							
Module Author:		Isabel O'Co	sabel O'Connor				
Departments:		School of C	chool of Computing				
Specifications of the qualifications and experience required of staff		Master's ar	r's and/or PhD degree in computing or cognate discipline. May have industry experience also.				
Learning Outco	mes						
On successful co	mpletion of this modu	le the learne	r will be able to:				
#	Learning Outcome	Description	Description				
L01	Explore research, fra	ameworks, ap	meworks, applications in edge and fog computing.				
LO2	Review underlying te problems in fog com	echnologies, l puting.	chnologies, limitations, and challenges along with future research direction and discuss generic conceptual framework for optimization buting.				
LO3	Analyse the restriction of IoT applications in	ictions introduced by the General Data Protection Regulation (GDPR), and discuss how these legal constraints affect the design and operation is in fog and cloud environments.					
LO4	Design and develop	simulation scenarios for Edge and Fog Computing using network simulator.					
Dependencies							
Module Recommendations							
No recommendations listed							
Co-requisite Modules							
No Co-requisite modules listed							
Entry requirements			See section 4.2 Entry procedures and criteria for the programme including procedures recognition of prior learning				

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Module Content & Assessment							
Indicative Content							
Edge and Fog Computing – Foundations Internet of Things (IoT) and New Computing Paradigms . Addressing the challenges in Federating Edge Resources							
Edge and Fog Computing – Foundations Integrating IoT + Fog + Cloud Infrastructures: System Modelling and Research Challenges							
Edge and Fog Computing – Foundations Management and Orchestration of Network slices in 5G, Fog, Edge and Clouds . Optimization problems in Fog and Edge Computing							
Middleware Middleware for Fog and Edge Computing: Design Issues . A Lightweight Container Middleware for Edge Cloud Architectures							
Middleware Data Management in Fog Computing							
Middleware Predictive analysis to develop to support Fog Application Deployment							
Middleware Using Machine Learning (ML) for protecting the security and privacy of IoT Systems							
Applications and Issues Fog Computing Realization for Big Data Analytics. Exploiting Fog Computing in Health Monitoring.							
Applications and Issues Smart Surveillance Video Stream Processing at the Edge for RealTime Human Objects Tracking. Fog Computing Model for Evolving Smart Transportation Applications.							
Applications and Issues Testing Perspectives of FogBased IoT Applications. Legal Aspects of Operating IoT Applications in the Fog.							
Model & Simulate Edge and Fog computing Model Fog and Edge Computing Environments Using network simulator toolkit (such as iFogSim, Ns3, OMNeT++, NetSim etc,)							
Model & Simulate Edge and Fog computing Simulate Fog and Edge Computing Environments Using network simulator Toolkit (such as iFogSim, Ns3, OMNeT++, NetSim etc,)							
Assessment Breakdown	%						
Coursework	40.00%						
End of Module Assessment	60.00%						
Assessments							

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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:	Project % of total:		40						
Assessment Date:	n/a	Outcome addressed:	4						
Non-Marked:	No								
Assessment Description: Model and simulate fog environment scenario that can be simulated through iFogSim. This enables the learner to gain a deep understanding of the edge and fog computing.									
End of Module Assessment									
Assessment Type:	Terminal Exam % of total:		60						
Assessment Date:	End-of-Semester	Outcome addressed:	1,2,3						
Non-Marked:	No								
Assessment Description: End-of-Semester Final Examination									
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									

Module Resources

Recommended Book Resources

Satish Narayana Srirama, Rajkumar Buyya,. (2019), , Fog and Edge Computing : Principles and Paradigms , Wiley ,.

Supplementary Book Resources

Abdulrahman Yarali,. (2018), , Cloud, Fog, and Edge: Technologies and Trends in Telecommunications Industry (Computer Science, Technology and Applications), Nova Science Pub Inc].

Mahmood, Zaigham,. (2018), , Fog Computing Concepts, Frameworks and Technologies, Springer.

Rahmani, A., Liljeberg, P., Preden, J.-S., Jantsch, A.,. (2018), , Fog Computing in the Internet of Things Intelligence at the Edge, Springer.

This module does not have any article/paper resources

This module does not have any other resources

Discussion Note: