MULTIMEDIA UNIVERSITY®

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Cloud Computing
2.	Course Code	TCC 3141
3.	Status of Course [Applies to (cohort)]	Specialisation Core for B.IT (Hons) Data Communications and Networking
4.	MQF Level/Stage	Bachelor – MQF Level 6
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version : Date of current version : June 2014
6.	Pre-Requisite	TOS1141 Operating System
7.	Name(s) of academic/teaching staff	Anang Hudaya Muhamad Amin Nazrul Muhaimin Ahmad
8.	Semester and Year offered	Trimester 1, Year 3
9.	**Objective of the course in the programme** : The primary objective of this course is to provide the techniques and practices of cloud computing, often called the internet as a platform. In addition, this course is to explore the current challenges facing cloud computing. Mainly focusing on cloud computing models, techniques, and architectures, this course will provide students with the advanced level of knowledge and hand-on experience in designing and implementing cloud-based software systems.	
10.	**Justification for including the course in the programme :** Cloud computing is changing the way businesses and users interact with computers and mobile devices. Gone are the days of expensive data centres, racks of disk drives, and large IT support teams. In their place are software applications delivered to users on demand from the cloud, high-capacity, auto-replicated, secure cloud-based disk-storage and databases, virtualized-server and desktop environments, and cloud-based collaboration tools which support on-premise-, remote-, and hybrid team success.	

11.	Course Learning Outcomes :	Domain	Level
	LO1: Identify the technical foundations of cloud systems architectures	Cognitive	Level 1
	LO2: Analyse the problems and solutions to cloud application problems	Cognitive	Level 4
	LO3: Demonstrate principles of best practice in cloud application design and management.	Cognitive	Level 3

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	LO4: Evaluate various development environments within the cloud that are conducive for developing applications	Cognitive	Level 6

12. Mapping of Learning Outcomes to Programme Outcomes :

Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
LO1	X	X							
LO2	X	X					X	X	
LO3	X	X	X				X	X	
LO4	X	X	X				X	X	

13. Assessment Methods and Types :

Method and Type	Description/Details	Percentage
Final Exam	Written examination	50
Assignment	Written report, group project, with teamwork scores	30
Midterm Test	Written examination	20

14. Mapping of assessment components to learning outcomes (LOs)

Assessment Components	%	LO1	LO2	LO3	LO4
Final Exam	50	50	50		50
Assignment	30	30	30	100	30
Midterm Test	20	20	20		20

15. Details of Course

Topics	Mode of Delivery	
	Lecture	Lab

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	1. Introducing Cloud Computing Web 2.0 and the Cloud; Distinguishing Cloud Types; Exploring Uses of the Cloud; Introducing Scalability; Introducing Virtualization; Collecting Processing Power Through Grid Computing	2	
	2. Software as a Service (SaaS) Getting Started with SaaS; Understanding the Multitenant Nature of SaaS Solutions; Understanding OpenSaaS Solutions; Understanding Service-Oriented Architecture (SOA)	2	4
	3. Platform as a Service (PaaS) IT Evolution Leading to the Cloud; Benefits of PaaS Solutions; Disadvantages of PaaS Solutions	2	4
	4. Infrastructure as a Service (IaaS) Understanding IaaS; Improving Performance Through Load Balancing; System and Storage Redundancy; Utilizing Cloud-Based NAS Devices; Advantages of IaaS Solutions; Server Types Within an IaaS Solution	4	4
	5. Data Storage in the Cloud Examining the Evolution of Network Storage; Understanding Cloud-Based Data Storage; Advantages and Disadvantages of Cloud-Based Data Storage; Getting Past the Fear of Cloud-Based Data; Cloud-Based Backup Systems; Understanding File Systems; Industry-Specific Cloud-Based Data Storage; Cloud-Based Database Solutions; Cloud-Based Block Storage	4	4
	6. Collaboration in the Cloud Collaborating in the Clouds; Questions to Ask About Collaborative Tools; Web- Based Collaboration Began with Web Mail; Instant Messaging Isn't What It Used to Be; Cloud-Based Phone and Fax Systems; Revisiting File Sharing; Collaborating via Web Logs (Blogs); Collaborative Meetings in the Cloud; Virtual Presentations and Lectures; Using Social Media for Collaboration; Using Cloud-Based Calendar Management; Using Streaming Video Content to Collaborate	4	2
	7. Virtualization Understanding Virtualization; The History of Virtualization; Leveraging Blade Servers; Server Virtualization; Desktop Virtualization; Desktop Solutions on Demand; Virtual Networks; Data Storage Virtualization; Not All Applications Are Well Suited for Virtualization; Why Virtualize?	4	2
	8. Securing the Cloud General Security Advantages of Cloud-Based Solutions; Introducing Business Continuity and Disaster Recovery; Understanding the Threats; Understanding Service-Level Agreements; ensuring Business Impact: The Essence of Risk Mitigation	2	

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	9. Migrating to the Cloud Define the System Goals and Requirements; Protect Your Existing Data; Use an Experienced Cloud Consultant; Know Your Application's Current Characteristics; Remember Vendor Lock-In; Define Your Training Requirements; Establish a Realistic Deployment Schedule; Review the Budget Factors; Identify IT Governance Issues; Understanding Cloud Bursting	4	
	Total	28	20

	Total Student Learning Time (SLT)	Face to Face / Guided Learning	Independent Learning
	Lecture	28	28
	Tutorials	-	-
	Laboratory/Practical	20	10
	Presentation	-	-
	Assignment	-	10
	Mid Term Test	2	4
	Final Exam	2	16
	Sub Total	52	68
	Total SLT	120	
16.	Credit Value	3	

17. Reading Materials :

Textbooks

1. Rajkumar Buyya, James Broberg; AndrzejGoscinski, (2011), Cloud Computing: Principles and Paradigms, John Wiley & Sons, Print ISBN: 978-0-470-88799-8

Reference Material (including 'Statutes' for Law)

1. Dr. Kris Jamsa, (2012) Cloud Computing, Jones & Bartlett Learning.
2. Thomas Erl; ZaighamMahmood; Ricardo Puttini, (2013), Cloud Computing: Concepts, Technology & Architecture, Prentice Hall, Print ISBN-10: 0-13-338752-6.
3. Luis Vaquero; Juan Cáceres; Juan Hierro, (2012), Open Source Cloud Computing Systems, IGI Global.
4. Stephen R Smoot; Nam K Tan ,(2011), Private Cloud Computing, Morgan Kaufmann, Print ISBN-13: 978-0-12-384919-9.

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Appendix (to be compiled when submitting the complete syllabus for the programme) :

1. Mission and Vision of the University and Faculty
2. Programme Objectives or Programme Educational Objectives
3. Programme Outcomes (POs)
4. Mapping of POs to the 8 MQF domain
5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below :

Subject	Learning Outcomes (please state the learning 0utcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
ABC1234	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			
DEF5678	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			

6. Summary of LO to PO measurement
7. Measurement and Tabulation of result for LO achievement
8. Measurement Tabulation of result for PO achievement