AND THE OF TECHNOLOGY AND THE OF THE		National Institute of Technology Meghalaya An Institute of National Importance													CURRICULUM	
Program	nme	ne Master of Computer Applications									Academic Year of Regulation			tion	on 2024-25	
Departm	nent	· · · · ·											ester		,	V
Course		Course Norse								Credit S	tructure			Marks Distribution		
Code		Course Name						e-Requisite	L	Т	Р	С	INT	MID	END	Total
CA673		Internet of Things							3	0	0	3	50	50	100	200
										CO's		Stat	ement		Bloom's	s Taxonomy
	sign	To provide the students with some knowledge about the definition and significance of the Internet of Things.								CA673.1	Able to demonstrate the basic concept of architecture of IoT, and applications of IoT real life.			of IoT in the		
Course		To develop the student's ability to understand the architecture, operation, and business benefits of an IoT solution.							Course Outcomes	CA673.2	Able to explain the mechanism of var protocols used in different layers of I				Understand	
	To c	To develop the student's ability to understand different protocols used for communication between various IoT devices.								CA673.3	Able to identify the challenges of Inte and techniques used for Interoperabil			eroperability ility in IoT.	Analyse	
Objectives		To develop the student's ability to understand the relationship between IoT, cloud computing, and big data.								CA673.4	Able to examine different Service and Discovery in IoT. Able to interpret about various privac security issues in IoT communication.			d Resource	Evaluate	
	Тор	To provide knowledge to students about various privacy and security issues in IoT.								CA673.5				-	Understand	
										CA673.6	Able to imagine and improve the relationship between IoT, cloud computing, fog computing big data.			tionship	Apply	
COs		Mapping with Program Outcomes (POs)											Мар	Mapping with PSOs		
	Р	O1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CA673.1		2					1	2		1	1			2	1	1
CA673.2		2	3	1	1		2	1		3	2	1	2	1	2	2
CA673.3		3	2	1		2	3		1		1	3	1	3	2	2
CA673.4		1		3	2		2	1		3	2	1		1	2	2
CA673.5		2		1		2	3	1		1	2	1		3	2	3
CA673.6		1	2		3	1	2		2		1			2	3	2
CA673	1.	.83	2.33	1.50	2.00	1.67	2.17	1.25	1.50	2.00	1.50	1.50	1.50	2.00	2.00	2.00
								SY	LLABUS							
No.							Co	ntent						Hours	COs	
W	ntroduction: hat is IoT, Ad-hoc and Sensor Networks, Architecture of IoT, Application of IoT: Smart home, Intelligent ansportation systems, Industrial aumtomation, Smart healthcare, Smart grids;												ntelligent	5	CA673.1	
De Co Ac Mu Po po III II Ap	IoT Standards: Designing the architecture of an IP-based IoT, Application Protocols: Constrained Application Protocol (CoAP), CoSIP, Message Queue Telemetry Transport (MQTT), Extensible Message and Presence protocol (XMPP), Advanced Message Queuing Protocol (AMQP), Data Distribution Service (DDS); Service Discovery Protocols: Multicast DNS (mDNS), DNS Service Discovery (DNS-SD); Infrastructure Protocols: Routing Protocol for Low Power and Lossy Networks (RPL), 6LoWPAN, IEEE 802.15.4 and ZigBee, Bluetooth Low Energy (BLE), Low-power Wi-Fi, IEEE 802.15.6, EPCglobal, LTE-A, Z-Wave; Interoperability: Applications in the IoT, The verticals: Cloud-based solutions, REST Architecture: The Web of Things, Messaging Queues and Publish/Subscribe Communications, Session initiations for the IoT, Optimized Communications: the Dual-network Management Protocol, Discoverability in Constrained Environments, Data Formats: Media types												cols: Low ow- essaging ions: the	6	CA673.2 CA673.3	
	r sens		arkup la	nguage;										4	<u> </u>	1672 <i>1</i>

Essential Readings

VI

Security and Privacy in the IoT:

Cloud and Fog Computing for IoT:

Authorization mechanisms for secure IoT services;

OAS application scenarios, Hybrid gateway-based communication;

1. Cirani S, Ferrari G, Picone M, Veltri L. Internet of Things: Architectures, Protocols and Standards. John Wiley & Sons; 2018.

Role of the IoT hub: Virtualization and replication, Operational scenarios, Synchronization protocol;

Total Hours

Architecture for Discovery in the IoT, Lightweight Service Discovery in Low-power IoT Networks;

Service and Resource Discovery, Local and Large-scale Service Discovery, Sclable and self-configuring

Privacy issues in the IoT: The role of Authentication, IoT-OAS: Delegation-based authorization for the IoT, IoT-

Cloud computing, Big data processing pattern, Big stream, Big stream and security, Fog computing and the IoT,

Security issues in the IoT: Traditional vs Lightweight security, Lightweight Cryptography, Key Agreement, Distribution and Security Bootstrapping, Processing data in the encrypted domain: Secure data aggregation,

2. Lea P. Internet of Things for Architects: Architecting IoT solutions by implementing sensors, communication infrastructure, edge computing, analytics, and security. Packt Publishing Ltd; 2018.

CA673.4

CA673.5

CA673.6

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42

3. Buyya R, Dastjerdi AV, editors. Internet of Things: Principles and paradigms. Elsevier; 2016.

Supplementary Readings

- 1. Chou T. Precision-Principles, Practices and Solutions for the Internet of Things. McGraw-Hill Education; 2017.
- 2. Santos M, Moura E. Hands-On IoT Solutions with Blockchain: Discover how converging IoT and blockchain can help you build effective solutions. Packt Publishing Ltd;
- 3. Al-Fuqaha A, Guizani M, Mohammadi M, Aledhari M, Ayyash M. Internet of things: A survey on enabling technologies, protocols, and applications. IEEE communications surveys & tutorials. 2015 Jun 15;17(4): 2347-76.