

Dr. Vasanttraodada Patil Shetkari Shikshan Mandal's
Padmabhooshan Vasanttraodada Patil Institute of Technology,
Budhgaon, Sangli (MS) – 416304
(An Autonomous Institute)

Affiliated to
Dr. Babasaheb Ambedkar Technological University,
Lonere, Raigad

(Accredited by NAAC)



Department of Electronics and Computer Science

Curriculum for Multidisciplinary Minor (MDM) Courses offered by

Electronics and Computer Science

w. e. f.


Academic Year: 2026-27




Dr. Vasantrodada Patil Shetkari Shikshan Mandal's
**PADMABHOOSHAN VASANTRODADA PATIL INSTITUTE OF
TECHNOLOGY, BUDHGAON, SANGLI. 416304**
An Autonomous Institute, affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad
Department of Electronics and Computer Science
Curriculum Structure and Evaluation Scheme
(Academic Year 2026-27 Onwards)


**Multidisciplinary Minor (MDM) Bucket offered by
Electronics and Computer Science Department**

MDM	Course Code	Multidisciplinary Minor	Semester	Credits
I	0ECSMDM205	Fundamentals of IoT	III	3
II	0ECSMDM255	IoT Technologies and Protocols	IV	3
III	0ECSMDM305	Industrial IoT	V	3
IV	0ECSMDM356	IoT System Design	VI	3
V	0ECSMDM405	Mini Project	VII	2


Dr. K. K. Pandeyaji
H.O.D. ECS


Dr. K. K. Pandeyaji
Dean Academics




Dr. S. S. Mohite
Director
(0th Revision)


0ECSMDM205**Fundamentals of IoT**


Course Code	0ECSMDM205			
Course Title	Fundamentals of IoT			
Semester	III			
Prerequisites	Basic Electronics and Electrical Engineering			
Teaching Scheme	Lecture	Tutorial	Practical	
	3	-	-	
Credit	03			
Evaluation Scheme	ISE 1	MSE	ISE 2	ESE
	10	20	10	60

Course Outcomes (COs):		Blooms Level
Upon successful completion of this course, Student will be able to:		
CO1	Explain the fundamental concepts and communication models of the Internet of Things	2
CO2	Demonstrate the features of M2M and distinguish between IoT and M2M	2
CO3	Identify and interface sensors, actuators, and embedded devices used in IoT system	2
CO4	Describe the architecture, features, and comparative aspects of embedded systems platforms such as 8051 and ARM processors used in IoT applications.	2
CO5	Apply IoT concepts to analyse domain-specific solutions for real-world applications on embedded platform	3

Course Contents (Topics Covered)

Unit No.	Contents	HRS
1.	Introduction to IoT Defining IoT, Characteristics of IoT, Physical design of IoT, Logical Design of IoT, Functional blocks of IoT, Communication models & APIs	6
2.	IoT and M2M Machine to Machine, difference between IoT & M2M, software define network	6
3.	Challenges in IoT Design Challenges, Development Challenges, Security Challenges, Other Challenges	6
4.	Sensors and Actuators Sensors-Definition, characteristics, types and their working - Gas sensor, Soil moisture sensor, DHT11, Ultrasonic sensor, IR sensor, sound sensor, LDR, accelerometer etc. Actuator- Definition, characteristics, types and their working - LED, Relay, DC motor, LCD etc.	6


Dr. K. K. Pandeyaji
H.O.D. ECS


Dr. K. K. Pandeyaji
Dean Academic




Dr. S. S. Mohite
Director

(0th Revision)

5.	Embedded systems for IoT 8051- An architectural view and family details, ARM7-Overview ,Evolution, and features, Basic ARM architecture, ARM family and comparison	8
6.	Domain Specific Applications of IoT Home Automation, Industry Applications, Surveillance Applications & Other IoT Applications	6
Total Hours		39

Text Books					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Internet of Things: A Hands - On Approach”	Vijay Madiseti, Arsheep Bahga	University Press	1	2015-
2.	Internet of Things	Shriram K Vasudevan Abhishek S Nagarajan RMD Sundaram	Wiley Publications	1	2019
3.	From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence	Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stamatis Karnouskos, Stefan Avesand, David Boyle	Elsevier Publication	1	2014
4.	The Internet of Things: Connecting Objects to the Web	Hakima Chaouchi	Wiley Publications	1	2010
5.	Building the Internet of Things with IPv6 and MIPv6 The Evolving World of M2M Communications	Daniel Minoli	Wiley Publications	1	2013

Reference Books					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Architecting the Internet of Things	Bernd Scholz-Reiter, Florian Michahelles	Springer	1	2011
2.	The Internet of Things” Key Applications and Protocols	Olivier Hersent, David Boswarthick, Omar Elloumi	Wiley Publications	2	2012
3.	INTERNET OF THINGS Architecture and Design Principles	Raj Kamal	McGraw Hill Education (India) Private Limited	1	2017
4.	Building the Internet of Things with IPv6 and MIPv6 The Evolving World of M2M Communications	Daniel Minoli	Wiley Publications	1	2013

K. K. Pandey
Dr. K. K. Pandeyaji
H.O.D. ECS

K. K. Pandey
Dr. K. K. Pandeyaji
Dean Academics



S. S. Mohite
Dr. S. S. Mohite
Director

(0th Revision)

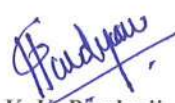
0ECSMDM255**IoT Technologies and Protocols**

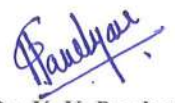
Course Code	0ECSMDM255			
Course Title	IoT Technologies and Protocols			
Semester	IV			
Prerequisites	Fundamentals of IoT			
Teaching Scheme	Lecture	Tutorial	Practical	
	3	-	-	
Credit	03			
Evaluation Scheme	ISE 1	MSE	ISE 2	ESE
	10	20	10	60

Course Outcomes (COs):		Blooms Level
Upon successful completion of this course, Student will be able to:		
CO1	Explain fundamentals of IoT networking and reference models in IoT.	2
CO2	Analyze and compare various IoT connectivity technologies required in IoT applications	4
CO3	Interpret IoT messaging and Internet protocols for data communication system	4
CO4	Evaluate cloud computing services, challenges, and security for IoT	4
CO5	Observe IoT Technologies in real world design for IoT applications	2

Course Contents (Topics Covered)

Unit No.	Contents	HRS
1.	IoT networking fundamental Wired and wireless communication, Network Topologies, OSI reference model, TCP/IP reference model, Standards and protocols	7
2.	IoT Connectivity Technologies UART, Wi-Fi, Bluetooth, Zigbee, IEEE 802.15.4, RFID, NFC, Cellular communication (4G/5G)	7
3.	IoT Messaging Protocols Message Queue Telemetry Transport (MQTT), Extensible Messaging and Presence Protocol (XMPP), Data Distribution Service (DDS), Advanced Message Queuing Protocol (AMQP)	6
4.	Protocols for IoT – Addressing and Identification Internet Protocol Version 4 (IPv4) IPv4 Protocol Format, Internet Protocol Version 6 (IPv6) IPv6 Protocol Format, Uniform Resource Identifier (URI)	6
5.	Cloud for IoT Introduction, IoT with Cloud – Challenges, Selection of Cloud Service Provider for IoT Applications: An Overview -Cloud Computing: Security Aspects	6


Dr. K. K. Pandeyaji
H.O.D. ECS


Dr. K. K. Pandeyaji
Dean Academic




Dr. S. S. Mohite
Director

(0th Revision)

6.	WSN and Big data Analytics WSN: Components of a wireless sensor node, Motivation for a Network of Wireless Sensor Nodes, Classification of sensor networks, Characteristics of wireless sensor networks, Challenges of wireless sensor networks Big data Analytics: Need of Big Data ,Classification of Data-Structured, Semi-structured and Unstructured, Definitions, Characteristics, Big Data Types, Big Data Classification ,Big Data Handling Techniques	7
Total Hours		39

Text Books					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Internet of Things	Shriram K Vasudevan Abhishek S Nagarajan RMD Sundaram	Wiley Publications	1	2019
2.	Internet of Things: A Hands - On Approach”	Vijay Madiseti, Arsheep Bahga	University Press	1	2015-
3.	The Internet of Things: Connecting Objects to the Web	Hakima Chaouchi	Wiley Publications	1	2010
4.	Fundamentals of Wireless Sensor Networks: Theory and Practice	Waltenegus Dargie, Christian Poellabauer	Wiley Publications	1	2010
5.	Big Data Analytics: Introduction to Hadoop, Spark, and Machine- Learning	Raj Kamal, Preeti Saxena	McGraw Hill Education (India) Private Limited	1	2019

Reference Books					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Architecting the Internet of Things	Bernd Scholz- Reiter, Florian Michahelles	Springer	1	2011
2.	Building the Internet of Things with IPv6 and MIPv6 The Evolving World of M2M Communications	Daniel Minoli	Wiley Publications	1	2013
3.	The Internet of Things” Key Applications and Protocols	Olivier Hersent, David Boswarthick, Omar Elloumi	Wiley Publications	2	2012
4.	INTERNET OF THINGS Architecture and Design Principles	Raj Kamal	McGraw Hill Education (India) Private Limited	1	2017

K. K. Pandya
Dr. K. K. Pandya
H.O.D. ECS

K. K. Pandya
Dr. K. K. Pandya
Dean Academics

S. S. Mohite
Dr. S. S. Mohite
Director

(0th Revision)

