Edge and Fog Computing	**L**	**T**	**P**	Fundamental of Computing
	3	**1**	**-**	

Course Objective: (1) To introduce the students about edge computing, fog computing, an important branch of distributed computing significant its applications in Data Science. (2)To implement the concepts of fog computing and exposes students to modern tools and API to deploy relevant infrastructures

S. NO	Course Outcomes (CO)
CO1	Explain the major components of fog and edge computing architectures.
CO2	Identify potential technical challenges of the transition process and suggest solutions.
CO3	Analyze data and application requirementswith its pertaining issues.
CO4	Design and model infrastructures in FoG and Edge Computing

S. NO	Contents	Contact Hours
UNIT 1	**Introduction to Fog Computing:** Fog Computing, Characteristics, Application Scenarios,Issues andchallenges. Fog Computing Architecture: Communication and Network Model, Programming Models, Fog Architecture for smart cities, healthcare and vehicles. Fog Computing Communication Technologies: Introduction, IEEE 802.11, 4G, 5G standards, WPAN, Short-Range Technologies,LPWAN and other medium and Long-Range Technologies.	**9**

UNIT 2	**Management and Orchestration of Network Slices in Fog and Edge:** Introduction,Background, Network Slicing in Software-Defined Clouds, Network Slicing, Management in Edge and Fog, Middleware for Fog and Edge Computing, Need for Fog and Edge Computing Middleware, Clusters for ightweight Edge Clouds, IoT Integration, Security Managementfor Edge Cloud Architectures.Fog Computing Realization for Big Data Analytics: Introduction to Big Data Analytics, Data Analytics inthe Fog, Prototypes and Evaluation.	**8**
UNIT 3	**Fog computing requirements when applied to IoT:** Scalability, Interoperability, Fog-IoT architectural model, Challenges on IoT Stack Model via TCP/IP Architecture, Data Management, filtering, EventManagement, Device Management, loudification, virualization, security and privacy issues. IntegratingIoT, Fog, Cloud Infrastructures: Methodology, Integrated C2F2T Literature by Modeling Technique byUse-Case Scenarios, Integrated C2F2T Literature by Metrics	**8**
UNIT 4	**Introduction to Edge Computing Scenarios and Use cases -** Edge computing purpose and definition, Edge computing use cases, Edge computing hardware architectures, Edge platforms, Edge vs Fog Computing, Communication Models - Edge, Fog, and M2M.	**6**
UNIT 5	**Exploiting Fog/Edge Computing in Health Monitoring:** An Architecture of a Health Monitoring IoT Based System with Fog/Edge Computing, Fog/Edge Computing Services in Smart E-Health Gateways, Discussion of Connected Components. **Fog/Edge Computing Model for Evolving Smart Transportation Applications:** Introduction, Data-Driven Intelligent Transportation Systems, Fog/Edge Computing for Smart Transportation, Applications Case Study: Intelligent Traffic Lights Management (ITLM) System.	**11**
	TOTAL	**42**

REFERENCES		
S.No.	**Name of Books/Authors/Publishers**	**Year of Publication / Reprint**
1	Fog Computing: Theory and Practice by Assad Abbas, Samee U. Khan, Albert Y. Zomaya, Wiley.	2020
2	IoT and Edge Computing for Architects - Second Edition, by Perry Lea, Publisher: Packt Publishing, 2020, ISBN: 9781839214806	2020
3	Fog and Edge Computing: Principles and Paradigms (Wiley Series on Parallel and Distributed Computing) by Rajkumar Buyya and Satish Narayana Srirama, ISBN: 978-1-119-52498-4	2019
4	Amir Vahid Dastjerdi and Rajkumar Buyya, ―Fog Computing: Helping the Internet of ThingsRealize its Potential, University of Melbourne	2016

B.Tech. Information Technology				
Course code:	**Course Structure**			**Pre-Requisite**
	L	**T**	**P**	Artificial intelligence and