

Branch Name:	Artificial Intelligence & Data Science
Program Code	ET108
Semester/Year:	Semester VI/ Third Year
Course Name:	Cloud and FOG Computing (Professional Elective –III)
Course Code:	2ET1080605T
Pre-requisite:	Basic knowledge of IoT, Molding & simulations, Concept of data management & security

Course Objective:

1. To understand the principles and paradigm of Cloud Computing
2. To understand the Service Model with reference to Cloud Computing
3. To appreciate the role of Virtualization Technologies
4. Ability to design and deploy Cloud Infrastructure
5. Understand cloud security issues and solutions
6. To Understand the Function of FOG Computing

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Subject Content:

Sr. No.	Topic	Total Hrs.	Weightage %
1	Introduction to Cloud Computing: Introduction to the Cloud Computing, History of cloud computing, Cloud service options, Cloud Deployment models, Business concerns in the cloud, pros and cons of cloud computing, cloud computing, Challenges and Risks	8	20
2	Resource Management and SLA Management: Exploring virtualization, Load balancing, Hypervisors, SLA Management, Types & Life Cycle of SLA, Cloud marketplace overview, Comparison of Cloud providers.	7	20
3	Programming, management console and storage on AWS AWS history, AWS Infrastructure, AWS services, AWS ecosystem, Basic Understanding APIs - AWS programming interfaces, Web services, AWS URL naming, Matching interfaces and services, Elastic block store - Simple storage service, Glacier - Content delivery platforms, docker.	6	15
4	AWS identity services, security and compliance Users, groups, and roles - Understanding credentials, Security policies, IAM abilities and limitations, AWS physical security - AWS compliance	6	15

	initiatives, Understanding public/private keys, Other AWS security capabilities.		
5	AWS computing and marketplace Elastic cloud compute - Introduction to servers, Imaging computers, Auto scaling, Elastic load balancing, Cataloging the marketplace, AMIs, Selling on the marketplace	5	10
6	Introduction to FOG computing: Fog Computing-Definition-Characteristics-Application Scenarios - Issues – Fog Computing and Internet of Things-Pros and Cons-Myths of Fog Computing -Need and Reasons for Fog Computing, Fog Computing vs Edge Computing	5	10
7	FOG Architecture: Types of FOG Computing, Components of FOG Computing, FOG Computing Architecture, Optimization Problems in Fog, Data Management in Fog Computing, Applications and Issues.	5	10

List of Reference Books:

1. Enterprise Cloud Computing - Technology, Architecture, Applications, Gautam Shroff, Cambridge University Press, 2010.
2. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010.
3. Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines, Wiley- India, 2010.
4. Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012
5. CloudComputing:Concepts,Technology&Architecture,RicardoPuttini,ThomasErl,andZaigham, May 2013
6. Fog and Edge Computing: Principles and Paradigms by Rajkumar Buyya, Satish Narayana Srirama.
7. Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wiley,2011.

e-Resources (If any):

1. <http://www.cloudbus.org/>
2. <https://www.tutorialspoint.com/what-is-fog-computing>
3. <https://www.javatpoint.com/fog-computing-vs-cloud-computing>
4. <https://www.techtarget.com/iotagenda/definition/fog-computing-fogging#:~:text=Fog%20computing%20is%20a%20computing,receive%2C%20with%20millisecond%20response%20time.>
5. <https://www.eccouncil.org/cybersecurity-exchange/ethical-hacking/fog-computing-everything-to-know/#:~:text=Components%20of%20Fog%20Computing&text=Data%20processing%3A%20Data%20processing%20is,a%20central%20location%20for%20storage.>
7. <https://www.educba.com/fog-computing-architecture/>

Course Learning Outcomes(CLO):On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Compare the strengths and limitations of cloud computing	4Analyze 2Understanding
CLO2	Identify the architecture, infrastructure and delivery models of Cloud computing	2Understanding
CLO3	Choose the appropriate cloud player, Programming Models And approach.	4Analyze
CLO4	Address the core issues of cloud computing such as security, Privacy and interoperability	2Understanding
CLO5	Design Cloud Services and Set a private cloud	2 Understanding 3 Applying

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CLO1	H	L	L	M	L	M			L				L	L		
CLO2		L	M	H	L	L					L	L	M	L		L
CLO3	L	M		M	M	H		M		L			M	L		
CLO4	M	L	M	L		H		M	L				M	L		
CLO5	L	L	L	L	M	H		M		L			H	L		M

H:High, M:Medium, L:Low