



Semester: VI						
CLOUD COMPUTING TECHNOLOGY & ARCHITECTURES						
Category: Professional Core Course (Theory))						
Course Code	:	AI364TA		CIE	:	100 Marks
Credits: L: T: P	:	03:01:00		SEE	:	100 Marks
Total Hours	:	45L+30T		SEE Duration	:	3.00 Hours

Unit-I					8 Hrs.
<b>Vision of Cloud Computing:</b> Defining a Cloud, Cloud Computing Reference Model, Characteristics and Benefits, Building Cloud Computing Environments					
<b>Principles of Parallel and Distributed Computing</b> Eras of Computing, Parallel vs. Distributed Computing, Elements of Parallel Computing, Elements of Distributed Computing					
Unit – II					8 Hrs.
<b>Virtualization:</b> Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples, Xen, VMware, Microsoft Hyper-V					
<b>Cloud Computing Architecture:</b> The cloud reference model, Types of clouds					
Unit –III					8 Hrs.
<b>Data-Intensive Computing:</b> What is data-intensive computing? Characterizing data-intensive computations, Challenges ahead, Historical perspective, Technologies for data-intensive computing – Storage systems, Programming platforms - Map Reduce.					
<b>Public Cloud Infrastructures:</b> Amazon Web Services - Compute, Storage, and Communication Services; Google AppEngine – Architecture, Microsoft Azure-Architecture and Roles.					
Unit –IV					10 Hrs.
<b>Introduction to Multi-Cloud:</b> Introduction to Multi-Cloud, setting out a real strategy for multi-cloud, Analysing the enterprise strategy for the cloud, Introducing the scaffold for multi-cloud environments, Understanding identities and roles in the cloud.					
<b>Enterprise Cloud Architecture:</b> Defining architecture principles for multi-cloud, using quality attributes in architecture, Defining principles from use cases-Business principles, Business principles, Principles for security and compliance, Data principles, Application principles, Infrastructure and technology principles, Principles for processes					
Unit –V					9 Hrs.
<b>Developing for Multi-Cloud with DevOps and DevSecOps,:</b> Introducing DevOps and CI/CD Getting started with CI/CD , Working under version control Using push and pull principles in CI Pushing the code directly to the main branch, Pushing code to forks of the main, Best practices for working with CI/CD. Using the DevSecOps Maturity Model, Manage traceability and auditability , Automating security best practices using frameworks					
<b>Introducing AIOps and GreenOps in Multi-Cloud:</b> Understanding the concept of AIOps, Optimizing cloud environments using AIOps, Exploring AIOps tools for multi-cloud, Introducing GreenOps					

Course Outcomes: After completing the course, the students will be able to:-	
<b>CO1</b>	Explain the concepts of cloud computing, models, infrastructure, services, distributed computing, and other related concepts.
<b>CO2</b>	Apply the fundamental concepts in virtualization, virtualization cluster datacentres to understand the efficiency in PAAS, SAAS, IAAS
<b>CO3</b>	Illustrate the fundamental concepts of Multi-cloud storage and demonstrate their use in different use cases
<b>CO4</b>	Analyse various cloud programming models and apply them to solve problems on the cloud.
<b>CO5</b>	Demonstrate the use of modern tools by exhibiting teamwork and effective communication skills



Reference Books	
1	Mastering Cloud Computing Foundations and Applications Programming-Morgan Kaufmann (2013) Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi ISBN: 978-0-12-411454-8
2	Jeroen Mulder ,Multi-Cloud Strategy for Cloud Architects_ Learn how to adopt and manage public clouds by leveraging BaseOps, FinOps, and DevSecOps,2 <sup>nd</sup> Edition,2023,Packt Publishing (2023), ISBN 978-1-80461-673-4
3	Distributed Computing and Cloud Computing, from parallel processing to internet of things ,Kai Hwang, GeofferyC.Fox, Jack J Dongarra ,1 <sup>st</sup> Edition, 2012, Elsevier, ISBN: 978-0-12-385880-1.
4	Cloud Computing Implementation, Management and Security .John W Rittinghouse, James F Ransome,, 1 <sup>st</sup> Edition, 2013, CRC Press, ISBN: 978-1-4398-0680-7.

RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)		
#	COMPONENTS	MARKS
1.	<b>QUIZZES:</b> Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. <b>THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.</b>	<b>20</b>
2.	<b>TESTS:</b> Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). <b>TWO tests will be conducted.</b> Each test will be evaluated for <b>50 Marks</b> , adding upto 100 Marks. <b>FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.</b>	<b>40</b>
3.	<b>EXPERIENTIAL LEARNING:</b> Students will be evaluated for their creativity and practical implementation of the problem. Case study based teaching learning (10), Program specific requirements (10), Video based seminar/presentation/demonstration (10) Designing & Modeling (10) <b>Phase 2 will be done in the exhibition mode (Demo/Prototype/any outcome). ADDING UPTO 40 MARKS.</b>	<b>40</b>
<b>MAXIMUM MARKS FOR THE CIE THEORY</b>		<b>100</b>

RUBRIC FOR SEMESTER END EXAMINATION (THEORY)		
Q. NO.	CONTENTS	MARKS
<b>PART A</b>		
1	Objective type questions covering entire syllabus	20
<b>PART B</b> (Maximum of TWO Sub-divisions only)		
2	Unit 1 : (Compulsory)	16
3 & 4	Unit 2 : Question 3 or 4	16
5 & 6	Unit 3 : Question 5 or 6	16
7 & 8	Unit 4 : Question 7 or 8	16
9 & 10	Unit 5: Question 9 or 10	16
<b>TOTAL</b>		<b>100</b>