

COURSE CODE	COURSE TITLE	L	T	P	C
1152CS120	CLOUD COMPUTING	3	0	0	3

Course Category: Program Elective

A. Preamble :

Cloud computing is an emerging computing paradigm where various users access the resources and services offered by service providers. Use of cloud computing at this course encompasses the production services and it can offer benefits in the cost, performance, and delivery of IT services. The use of cloud computing services is forecast to grow significantly over the coming years.

B. Prerequisite Courses:

Sl. No	Course Code	Course Name
1	1151CS111	Computer Networks
2	1151CS103	Programming in Java
3	1151CS117	Java Programming

C. Related Courses:

Sl. No	Course Code	Course Name
1	1152CS101	Cryptography and Network Security

D. Course Educational Objectives :

Students undergoing this course are expected to gain:

- To access cloud resources and services needed to perform functions with dynamically changing needs.
- To understand the cloud privacy and security concepts to create secure cloud environment.
- To learn the various cloud platforms to implement real time cloud applications.

E. Course Outcomes :

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Outline the various cloud service delivery and deployment models.	K2
CO2	Interpret the role of virtualization in cloud environment.	K2
CO3	Explain the various private cloud deployment models.	K2
CO4	Explain the cloud service working models in public cloud environment.	K2
CO5	Relate the cloud security with traditional security to adapt the future trends of Cloud Computing	K2

F. Correlation of COs with POs :

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	M	L	L		L								L	L	
CO2	M	M	L	L	M		L		L				M	M	
CO3		L	M	M	M	M	M		L			L		M	
CO4		M	M	M	M	M	M		M			L		M	M
CO5		L	L		M	M		M				M		M	M

G. Course Content:

Unit I: Overview of Cloud Computing **9**

Brief history and evolution - History of Cloud Computing, Evolution of Cloud Computing, Traditional vs. Cloud Computing. Why Cloud Computing, Cloud service models (IaaS, PaaS & SaaS). Cloud deployment models (Public, Private, Hybrid and Community Cloud), Benefits and Challenges of Cloud Computing. Introduction to AWS Public Cloud Vendor.

Unit II: Virtualization **9**

Basics of virtualization, Server virtualization, VM migration techniques, Role of virtualization in Cloud Computing.

Unit III: Working with Private Cloud **9**

Private Cloud Definition, Characteristics of Private Cloud, Private Cloud deployment models, Private Cloud Vendors - CloudStack, Eucalyptus and Microsoft, Private Cloud – Benefits and Challenges. Private Cloud implementation in Amazon EC2 service.

Unit IV: Working with Public Clouds **9**

What is Public Cloud, Why Public Cloud, When to opt for Public Cloud, Public Cloud Service Models, and Public Cloud Vendors and offerings (IaaS, PaaS, SaaS). Demonstrating public cloud with AWS, Introduction to EC2 and Storage services of AWS. Private vs. Public Cloud – When to choose.

Unit V: Overview of Cloud Security and Future directions in Cloud Computing **9**

Explain the security concerns in Traditional IT, Introduce challenges in Cloud Computing in terms of Application Security, Server Security, and Network Security. Security reference model, Abuse and Nefarious Use of Cloud Computing, Insecure Interfaces and APIs, Malicious Insiders, Shared Technology Issues, Data Loss or Leakage, Account or Service Hijacking, Unknown Risk Profile, Shared security model between vendor and customer in IAAS/PAAS/SAAS, Implementing security in AWS. When and not to migrate to Cloud, Migration paths for cloud, Selection criteria for cloud deployment, Issues/risks in cloud computing, Future technology trends in Cloud Computing.

TOTAL: 45 Hours

H. Learning Resources

Text Book

1. Rajkumar Buyya, James Broberg, Andrzej Goscinski, "Cloud Computing: Principles and Paradigms", Wiley, 1st Edition, 2013. ISBN-10: 9788126541256, ISBN-13: 978-8126541256.
2. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", QUE, 1st Edition, 2008. ISBN-10: 9780789738035, ISBN-13: 978-0789738035.
3. Judith S. Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper, "Cloud Computing For Dummies", For Dummies, 1st Edition, 2010.
4. Toby Velte, Anthony Velte, Robert C. Elsenpeter, "Cloud Computing-A Practical Approach", McGraw-Hill Education, 1st Edition, 2009. ISBN-10: 0071626948, ISBN-13: 978-0071626941.
5. Borko Furht, Armando Escalante, "Handbook of Cloud Computing", Springer, 2010th Edition, 2010. ISBN-10: 1441965238, ISBN-13: 978-1441965233.

Reference Book

1. John W. Rittinghouse, James F. Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 1st Edition, 2009. ISBN-10: 9781439806807, ISBN-13: 978-1439806807.
2. Barrie Sosinsky, "Cloud Computing Bible", Wiley, First Edition, 2011. ISBN-10: 8126529806, ISBN-13: 978-8126529803.
3. John Rhoton, Risto Haukioja, "Cloud Computing Architected: Solution Design Handbook", Recursive, Limited, 2011. ISBN-10: 0956355617, ISBN-13: 978-0956355614.
4. Ronald L. Krutz, Russell Dean Vines, "Cloud Security: A Comprehensive Guide to Secure Cloud Computing", Wiley, 1st Edition, 2010. ISBN-10: 0470589876, ISBN-13: 978-0470589878.

