



ST. ALOYSIUS COLLEGE(AUTONOMOUS), JABALPUR

Reaccredited 'A+' Grade by NAAC(CGPA:3.68/4.00)

College with Potential for Excellence by UGC

DST-FIST Supported & STAR College Scheme by DBT

Faculty of Science

Bachelor of Science (B.Sc.), VI Semester

SUBJECT: COMPUTER SCIENCE

Paper- DSE IB

Cloud Computing and Big Data

Course Outcomes

CO. No.	Course Outcomes	Cognitive Level
CO 1	Know the fundamentals of Cloud, Cloud Architecture, and types of services and Deployment Models.	U, R
CO 2	Understand the concept of virtualization and how this has enabled the development of Cloud Computing	R, U, Ap
CO 3	Understand Big Data technologies, HADOOP, Cloud databases and cloud security	U, R
CO 4	Explore some important cloud computing Open Source and Commercial Clouds Platforms.	U, An
CO 5	Solve a real-world problem using cloud computing through group collaboration.	U,An, Ap

Credit and Marking Scheme

	Credits	Marks		Total Marks
		Internal	External	
Theory	4	40	60	100
Practical	2	40	60	100
Total	6		200	

Evaluation Scheme

	Marks	
	Internal	External
Theory	3 Internal Exams of 20 Marks (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of the Semester)
Practical	3 Internal Exams (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of the Semester)





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Bachelor of Science (B.Sc.)
VI Semester

Subject: Computer Science
Paper: DSE-IB, Cloud Computing and Big Data

No. of Lectures (in hours per week): 2 Hrs. per week

Total No. of Lectures: 60 Hrs.

Maximum Marks: 60

Units	Topics	No. of Lectures
I	Introduction to Cloud Computing: Overview, NIST Definition of Cloud Computing, NIST features, Historical Development, Need for Cloud Computing, Principles of Cloud Computing, Challenges and Risk of Cloud Computing, Advantages and Drawbacks. Cloud applications: Scientific Applications, Business and Consumer Applications, Productivity Applications, Online Social Networking Applications, and Media Applications.	12
II	Cloud Architecture and Model: Cloud Computing Architecture, Cloud Reference Model, NIST Cloud Computing Reference Architecture, IBM Cloud Computing Reference Architecture, Cloud Security Alliance (CSA) Reference Model. Service and Deployment Models: Infrastructure As A Service (IaaS), Platform As A Service (PaaS), Software As A Service (SaaS), Other Cloud Service Models, Public, Private, community and Hybrid Deployment Models.	12
III	Virtualization Technology: Meaning and Level of Virtualization, Hypervisor, Type 1 Hypervisor, Type 2 Hypervisors. Full virtualization, Para-virtualization, and Hardware Assisted Virtualization. Types of Virtualizations: Server Virtualization, Storage Virtualization, Network Virtualization, Operating System Virtualization, Application Server Virtualization, Creating A Virtual Machine.	12
IV	Big Data: Overview, Need of Big Data, Characteristics, Benefits of Big Data Processing, Big Data Technologies, HADOOP: Hadoop Architecture, Hadoop Ecosystem, HDFS Architecture. MapReduce. Cloud Database NoSQL: Relational, non-relational vs. DBaaS Cloud Database, Cloud Databases, Amazon Dynamo Database, HBase, Cassandra, MongoDB.	12
V	Cloud Security: Cloud Information Security Fundamentals, Cloud Security Services, Cloud Security Concerns, Security Challenges, Infrastructure Security, Cloud computing security architecture. Case Study Open-Source Clouds Platform: Hadoop, OpenStack, Cloud Stack, Eucalyptus, OpenNebula. Commercial Clouds Platform: Google App Engine, Microsoft Azure, Amazon	12

References

Text Books:

- Cloud Computing by Pawan Thakur, Susheela Pathania (Satya Prakashan New Delhi)
- Cloud Computing By Gautam Shroff (Cambridge Enterprise)
- Cloud Computing: A Practical Approach by Antohy T Velte (McGraw Hill)



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- Cloud Computing Bible by Barrie Sosinsky(Wiley India)

Reference Books:

- Bloor R., Kaufman M., Halper F. Judith Hurwitz “Cloud Computing for Dummies”, Wiley India Edition.
- John Rittinghouse & James Ransome, “Cloud Computing Implementation Management and Strategy”, CRC Press.
- Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”.
- James E Smith, Ravi Nair, “Virtual Machines”, Morgan Kaufmann Publishers.



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List of Practical

1. Download and Install Virtual Machine (Virtual Box, VMware, and KVM)
2. Installing Virtual Machine
3. Controlling Virtual Machine (Start, restart, power off)
4. Editing Virtual Machine Hardware
5. Creating and Using Image Snapshots
6. Importing and Exporting Virtual Machine Images
7. Accessing Linux Command Line
8. Managing Files from the Command Line
9. Creating, Viewing, and Editing Text Files
10. Installing and Updating Software Packages

