Maharashtra Institute of Technology, Aurangabad
(An Autonomous Institute)

Maharashtra Institute of Technology

(An Autonomous Institute)

Proposed Honours* in "Cloud Computing"

Major Disciplines in

Bachelor in Computer Science and Engineering

Bachelor in Artificial Intelligence and Data Science

Bachelor in Computer Science and Design

(With effect from A.Y. 2022-23)

Honours*in Cloud Computing

Year & Semester	Course Code	Course	Teaching Scheme Hours/Week: Lecture	Tutorial	Practical	Examination Scheme and Marks: Mid-Sem Exam-I	Mid-Sem Exam-II	Continuous Internal Evaluation	Teachers Assessment	End-Semester Exam	Practical	Total Marks	Credit Scheme: Lecture/Tutorial	Practical	Total Credit
SY Sem IV	CSE901	Cloud Computing Foundation	04	--	--	15	15	10	10	50	--	100	04	--	04
	CSE971	Laboratory	--	--	02	--		--	25	--	--	25	--	01	01
		Total	04	--	02	125						125	04	01	05
													Total Credits = 05		
TY Sem V	CSE902	Basic Services in Cloud	04	--	--	15	15	10	10	50	--	100	04	--	04
		Total	04	--	--	100						100	04	--	04
													Total Credits = 04		
TY Sem VI	CSE903	Database and Storage in Cloud Computing	04	--	--	15	15	10	10	50	--	100	04	--	04
	CSE972	Laboratory	--	--	02	--	--	--	25	--	--	25	--	01	01
		Total	04	--	02	125						125	04	01	05
													Total Credits = 05		
Final B.Tech. Sem VII	CSE904	Economics and Billing in Cloud	04	--	--	15	15	10	10	50	--	100	04	--	04
		Total	04	--	--	100						100	04	--	04
													Total Credits = 04		
Final B.Tech. Sem VIII	CSE973	Mini Project	--	--	04	--	--	-	25	--	25	50	--	02	02
		Total	--	--	04	--	--	--	25	--	25	50	--	02	02
													Total Credits = 02		
Total Credit for Semester IV+V+VI+VII +VIII = 20															

Master Copy

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Dean
Academics
Maharashtra Institute of Technology
Aurangabad.

Chairman Academic Council
MIT Aurangabad
(An Autonomous Institute)

Department of Computer Science and Engineering **Syllabus of S.Y. B. Tech. (Honours* in Cloud Computing) Semester-IV**		
Course Code: CSE901 Course: Cloud Computing Foundation **Teaching Scheme:** Lecture: 04 Hrs/week		Credits: 4-0-0 Mid Semester Examination-I: 15 Marks Mid Semester Examination-II: 15 Marks Continuous Internal Evaluation:10 Marks Teacher Assessment: 10 Marks End Semester Examination: 50 Marks End Semester Examination (Duration): 2 Hrs
Prerequisite	Cloud Computing Basics.	
Objectives	1.To review and strengthen important concepts of Cloud Computing 2.Introduce the concept cloud computing.	
Unit-I	Introduction to the cloud computing, Advantages of cloud computing, Cloud Adoption Framework, Cloud Computing models, Cloud service categories. IAAS, PAAS, SAAS. Pricing Models, Billing and Cost concepts, Pricing Calculator. **(08 Hrs)**	
Unit-II	Introduction to the Cloud Infrastructure, On premises Infrastructure, Global Connectivity of cloud computing, Cloud Dashboard Management, Cloud Region, Cloud Availability Zone, Edge Location, Data Centers, Cloud Server. **(08 Hrs)**	
Unit-III	Introduction EC2, Define EC2, Compute service overview, EC2 Cost Optimization, Container, Lambda service and its category, difference between managed service and unmanaged service in EC2, Elastic Benstalk service and its application.**(08 Hrs)**	
Unit-IV	Introduction to the Cloud Security, Concept of Identity Access Management Service, Shared Responsibility Model, Customers responsibility and Cloud Service Provide Responsibility, Cloud Account Security, Cloud Root Security, Cloud Customer Security. Ensure Security Compliance through Dashboard. **(08 Hrs)**	
Unit-V	Cloud Network, Introduction to virtualization, Concept of Virtual Machines, Define Instances in cloud, Cloud Network basics, Cloud Network services, Virtual Private Cloud, Virtual Private Network. Cloud front service, Cloud Watch service. **(08 Hrs)**	

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Unit-VI	Cloud Content Delivery methods, VPC security, Route 53 service of cloud computing, Lab Diagram (10 systems), VPC and VPN configuration. Cloud Identity Access group, VPN and VPC cloud compliances. **(08 Hrs)**

Reference books		Title	Author	Publication	Edition
	1.	Mastering Cloud Computing	Rajkumar Buyya	Mcgraw Hill	2015
	2.	Cloud Computing Implementation Management and security	John W Ritting House	CRC Press	2014
	3.	Cloud Computing A Practical approach	Anthony T Velte	Mcgraw Hill	2015
	4.	Cloud Computing Web based application that change the way you work and collaborate online	Nichael Miller	Pearson	2015

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Department of Computer Science and Engineering Syllabus of S. Y. B. Tech. (Honours* in Cloud Computing) Semester-IV		
Course Code: CSE971 Course: Laboratory Cloud Computing Foundation **Teaching Scheme**: Practical: 02 Hrs/week		Credits: 0-0-1 Teacher Assessment: 25
Prerequisite	Basics of Internet and Computer Network	
Objectives	Basic Implementation of Cloud	
List of Practical	1. To Study Cloud Computing Basic Services (IAAS, PAAS, SAAS). 2. To Study create Warehouse application in saleforce.com 3. Creating an Application in SalesForce.com using Apex programming Language 4. Implementation of SOAP Web services in C#/JAVA Applications 5. Implementation of Para-Virtualization using VMware's Workstation/ Oracle's Virtual Box and Guest O.S. 6. Installation and Configuration of Hadoop and Glacier service ofAWS 7. Create an application (Ex: Word Count) using Hadoop Map/Reduce. 8. To Study and implement Amazon Web Services: EC-II and Container	

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Department of Computer Science and Engineering Syllabus of T. Y. B. Tech. (Honours* in Cloud Computing) Semester-V	
Course Code: CSE902 Course: Basic Services in Cloud **Teaching Scheme:** Lecture: 04 Hrs/week	Credits: 4-0-0 Mid Semester Examination-I: 15 Marks Mid Semester Examination-II: 15 Marks Continuous Internal Evaluation:10 Marks Teacher Assessment: 10 Marks End Semester Examination: 50 Marks End Semester Examination (Duration): 2 Hrs

Prerequisite	Cloud Computing Basics of services.
Objectives	1.To review and strengthen important concepts of Cloud Computing 2. Introduce the concept cloud computing
Unit-I	Introduction to Cloud services, Concept of Infrastructure as a Service, Platform as a service, Software as service, protocols in cloud computing (HTTP, FTP, IP, TCP), On-Demand Service, Pay as you go service, measured service. **(08 Hrs)**
Unit-II	Introduction to Compute service of cloud computing, Elastic Cloud Computing service, EC-2 Cost Optimization, ECS service, EKS service, Lambda Service, ECR service, Concept of Container, Concept of Docker, Cloud Trail and Config service of Cloud computing. **(08 Hrs)**
Unit-III	Introduction to cloud Database Service, Concept of Relational Database Service (RDS), Cloud computing databases: Mongodb, RedhShift, Aurora. Cloud database Dynomodb. **(08 Hrs)**
Unit-IV	Introduction to Cloud Storage service, Simple Storage service (S3), Basic function of S-3 Storage, Elastics Block Storage (EBS), Elastic File Storage (EFS), Difference between EBS and EFS storage, Cloud Glacier service for database creation, Cloud Object Storage, Cloud Block Storage. **(08 Hrs)**
Unit-V	Introduction to the VPC service, Subnet, Network load balancing, Network Gateway, IP-V4 and IP-V6, Reserved IP Address, Elastic Network Interfaces, NAT (Network Address Translation), VPC Sharing, On-Premises Server, Security Group

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

	services and Key pair services. **(08 Hrs)**				
Unit-VI	Introduction to Site to Site Networking in Cloud Computing, Concept of VPN (Direct Connect), VPC End Point, Concept of Transit Gateway, VPC Security Group, Network ACL **(08 Hrs)**				
Reference books		**Title**	**Author**	**Publication**	**Edition**
	1.	Mastering Cloud Computing	Rajkumar Buyya	Mcgraw Hill	2015
	2.	Cloud Computing Implementation Management and security	John W Ritting House	CRC Press	2014
	3.	Cloud Computing A Practical approach	Anthony T Velte	Mcgraw Hill	2015
	4.	Cloud Computing Web based application that change the way you work and collaborate online	Nichael Miller	Pearson	2015

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Department of Computer Science and Engineering **Syllabus of T. Y. B. Tech. (Honours* in Cloud Computing) Semester-VI**		
Course Code: CSE903 Course: Database Storage in Cloud Computing **Teaching Scheme:** Lecture: 04 Hrs/week		Credits: 4-0-0 Mid Semester Examination-I: 15 Marks Mid Semester Examination-II: 15 Marks Continuous Internal Evaluation:10 Marks Teacher Assessment: 10 Marks End Semester Examination: 50 Marks End Semester Examination (Duration): 2 Hrs
Prerequisite	Cloud Computing Basics and storage.	
Objectives	1.To review and strengthen important concepts of Cloud Computing. 2.Introduce the concept cloud computing and Storage services of Cloud.	
Unit-I	Introduction to cloud Storage, Storage billing and Dashboard, Block Storage,Object Storage, individual storage volume, boot volume for EC-2 instances, Data storage, file system, database host, enterprise application for storage of cloud services. **(08 Hrs)**	
Unit-II	Elastic Block storage volume types, EBS features, Simple storage service (S-3), S-3 Bucket, S-3 Storage Classes, Amazon S3 Intelligent Tiering, Amazon S3 Standard, Infrequent Access (Amazon S3 Standard, Amazon S3 One Zone, Infrequent Access (Amazon S3 One Zone, Amazon S3 Glacier, Amazon S3 Glacier Deep Archive. **(08 Hrs)**	
Unit-III	Introduction to Elastic File System, EFS features, EFS Architecture, EFS implementation, EFS resources, Glacier Storage service and its working principle, Glacier service use cases, life cycle policies, cloud storage services, S3 and S3 Glacier services. **(08 Hrs)**	
Unit-IV	Introduction to storage server, server encryption, client decryption, KMS (Key Management Service), CMKS (Customer Master Keys), Storage control access service, Data archive with cloud services, 119s durability of storage. **(08 Hrs)**	

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Unit-V	Comparison of difference types of storage in cloud computing, EBS, EFS, S-3, Glacier, Functions of EFS, Durability of EBS, Consistency of S-3, Customer and service provider service of cloud storage. **(08 Hrs)**
Unit-VI	Introduction to storage snapshot service, storage elasticity, difference between SSD and HHD, Storage volume and its type, mounting, Temporary storage, Pricing model for storage, Storage consol. **(08 Hrs)**

Reference books

	Title	Author	Publication	Edition
1	Cloud Computing Bible	Barrie Sosinsky	Wiley	2010
2	Enterprise Cloud Computing Technology Architecture	Gautam Shroff	Cambridge University	2014
3	Web Technologies TCP /IP Web Java Programming & Cloud Computing	Achut Godbole	Mcgraw Hill	2014
4	Cloud computing with the Window Azure Platform	Roger Jennings	Wiley	2015

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Department of Computer Science and Engineering Syllabus of T. Y. B. Tech. (Honours* in Cloud Computing) Semester-VI	
Course Code: CSE972 Course: Laboratory Database Storage in Cloud Computing **Teaching Scheme:** Practical: 02 Hrs/week	Credits: 0-0-1 Teacher Assessment: 25 Marks

Prerequisite	Basics of Web Programming.
Objectives	To implement Database concepts in Cloud.
List of Practical	1. Installation and configuration of own Cloud 2. Implementation of Virtualization in Cloud Computing to Learn Virtualization Basics, Benefits of Virtualization in Cloud using Open Source Operating System 3. Study and implementation of infrastructure as Service using Open Stack. 4. Write a program for Web feed using PHP and HTML. 5. Write a Program to Create, Manage and groups User accounts in own Cloud by Installing Administrative Features. 6. To Study Amazon Lambda Service. 7. To Study Amazon RDS service for the database. 8. To Study Amazon Object storage.

The Assessment of Teacher Assessment: shall be done based on the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Practical/Oral examination conducted on the syllabus and term work mentioned above

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Department of Computer Science and Engineering

Syllabus of Final year B. Tech. (Honours* in Cloud Computing) Semester-VII

Course Code:CSE904 Course: Economics and Billing in Cloud **Teaching Scheme:** Lecture: 4 Hrs/week	Credits: 4-0-0 Mid Semester Examination-I: 15 Marks Mid Semester Examination-II: 15 Marks Continuous Internal Evaluation:10 Marks Teacher Assessment: 10 Marks End Semester Examination: 50 Marks End Semester Examination (Duration): 2 Hrs

Prerequisite	Cloud Computing Basics and dashboard / billing.
Objectives	1. To review and strengthen important concepts of Cloud Computing. 2. Introduce the concept cloud computing and cost and budgeting.
Unit-I	Fundamental of cloud pricing, Cloud Pricing philosophy, Pricing Characteristics, Pricing Calculator, Service utilization methodology, Billing and Account Visibility of Cloud services, Billing Dashboard. **(08 Hrs)**
Unit-II	Introduction to Cloud Cost explorer, Services and Budgeting, Cost of services used, Service usage report, Data Transfer rate, Cloud Upfront Expenses, Tiered Pricing model, Custom pricing model, Cloud free tier concept. **(08 Hrs)**
Unit-III	Cloud services with no charge, VPC, Beanstalk, Auto Scaling, Cloud Formation, Identify Access management, Consolidated billing model, Inbound data transfer, Outbound data transfer, Introduction to TCO (Total Cost of Ownership), Business cases and workload. **(08 Hrs)**
Unit-IV	Introduction to Service cost, Storage cost, Network cost, IT Labor Cost, On Premises billing model, Pricing Calculator, Reading and estimate, ROI and billing dashboard, Storage saving, instance saving.
Unit-V	Introduction to policy based account management; Group based account management, Automate Account Management, Service Control Polices, Cloud Management Counsel, Command Line Interface, SDK (Software Development Kit). **(08 Hrs)**

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Unit-VI	Introduction to cost management and billing, Spend Summary, Cloud Budget,Cloud Usage report, Forecast and track costs, SNS (Simple Notification Service), Technical support, Cloud support plan. **(08 Hrs)**				
Reference books		**Title**	**Author**	**Publication**	**Edition**
	1	Cloud Computing Bible	Barrie Sosinsky	Wiley	2010
	2	Enterprise Cloud Computing Technology Architecture	Gautam Shroff	Cambridge University	2014
	3	Web Technologies TCP /IP Web Java Programming & Cloud Computing	Achut Godbole	Mcgraw Hill	2014
	4	Cloud computing with the Window Azure Platform	Roger Jennings	Wiley	2015

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Department of Computer Science and Engineering

Syllabus of Final Year. B. Tech. (Honours* in Cloud Computing) Semester-VIII

Course Code: CSE973 Course Lab : Mini Project **Teaching Scheme:** Practical: 04 Hrs/week	Credits: 0-0-2 Teacher Assessment: 25 Marks Practical: 25 Marks
Prerequisite	Web Programming and Computer Network.
Guidelines	To carry out a mini project in Cloud Computing. Each student will have a faculty mentor to guide them. There will be three reviews with below mentioned details:

Review #	Requirement	Mark Weightage	
		Internal	External
0	Idea Presentation/ Selection	-	-
1	Literature Review / Proposal for Project	10%	-
2	Proposed System Design/ Model	20%	-
3	Implementation and Demonstration	20%	-
End Semester Exam	Final Viva-Voce and Project Demonstration	-	50%

The assessment of teacher assessment shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above.

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy

Note:

1. No additional fees will be charged for students opting for Honours/ Minor Degree
2. All the courses in the Honours/ Minor will be conducted in offline mode.
3. Re-examination is not applicable in Honours and Minor Scheme. Student failing in any of the Minor or Honours courses,at any stage will be discontinued from the Scheme.
4. Examination Scheme and Passing rules will be as per the academic rules and regulations of B. Tech.

Chairman Board of Studies
Computer Science & Engineering
MIT Aurangabad
(An Autonomous Institute)

Master Copy