COURSE HANDOUT

CLOUD COMPUTING (COM-601)

CSE- 6th SEMESTER

ACADEMIC YEAR (2024-25)

Ms. Vishalika

Assistant Professor

Department of Computer Science and Engineering

Department of Computer Science and Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
COM-601	Cloud Computing	PCC	4	3	1	0	50	100	150
Faculty Details	vishalika.it@mietjammu.in								

Section-A

Unit 1: Fundamental Cloud Computing: Understanding Cloud Computing, Fundamental Concepts and Models: Roles, Characteristics, Cloud Delivery & Deployment Models, Cloud-Enabling Technology : Broadband Networks and Internet Architecture, Data Center & Virtualization Technology, Web, Multitenant and Service Technology, Fundamental Cloud Security : Basic Terms and Concepts, Threat Agents, Cloud Security Threats. Risk Management.

(8 Hrs)

Unit 2: Cloud Computing Mechanisms: Cloud Infrastructure Mechanisms: Virtual Server, Cloud Storage Device, Usage Monitor, Resource Replication, Specialized Cloud Mechanisms: Load Balancer, SLA Monitor, Hypervisor, Multi-Device Broker, Cloud Management Mechanisms, Cloud Security Mechanisms: Encryption, Hashing, Digital Signature, Public Key Infrastructure (PKI), Identity and Access Management (IAM), Single Sign-On (SSO).

(10 Hrs)

Unit 3: Cloud Computing Architecture: Fundamental Cloud Architectures: Workload Distribution, Resource Pooling, Service Load Balancing and Dynamic Scalability Architecture, Advanced Cloud Architectures: Hypervisor Clustering, Load Balanced Virtual Server Instances, Zero Downtime and Dynamic Failure Detection and Recovery Architecture.

(10 Hrs)

Section-B

Unit 4: Working with Clouds: Cloud Delivery Models: Cloud Provider and Consumer perspective, Building and Working with IaaS, PaaS and SaaS service environments, Business Cost Metrics, Cloud Usage Cost Metrics, Service Quality Metrics: Service Availability, Service Performance, Service Scalability and Service Resiliency Metrics.

(10 Hrs)

Unit 5: Advanced Cloud Practices and Case Studies: Industry Standards Organizations, Data Center Facilities, Cloud-Adapted Risk Management Framework, Case Studies.

(6 Hrs)

Text Books

S.No.	Name of the Books	Author	Publisher Name	Edition (Pub. yr.)
1	Cloud Computing: Concepts, Technology & Architecture	Thomas Erl, Zaigham Mahmood, and Ricardo Puttini	PHI	1st (2013)

Reference Books

S.No.	Name of the Books	Author	Publisher Name	Edition (Pub. Yr.)
1	Cloud Computing (Principles and Paradigms)	Rajkumar Buyya, James Broberg,Andrzej Goscinski	John Wiley & Sons, Inc	1st (2013)
2	Cloud computing a practical approach	Anthony T.Velte , Toby J. Velte Robert Elsenpeter	TATA McGraw Hill	1st (2017)

COURSE PLAN		
Unit-I Fundamental Cloud Computing		
S.No	**Topics**	**Recommended Books**
1	Understanding Cloud Computing	Book 1, Ch.3
2	Fundamental Concepts and Models: Roles, Characteristics, Cloud Delivery & Deployment Models	Book 1, Ch.4
3	Cloud-Enabling Technology: Broadband Networks and Internet Architecture	Book 1, Ch.5
4	Data Center & Virtualization Technology	Book 1, Ch.5
5	Web, Multitenant and Service Technology	Book 1, Ch.5
6	Fundamental Cloud Security: Basic Terms and Concepts	Book 1, Ch.6
7	Threat Agents, Cloud Security Threats	Book 1, Ch.6
8	Risk Management	Book 1, Ch.6
Unit-II Cloud Computing Mechanisms		
9	Cloud Infrastructure Mechanisms: Virtual Server	Book 1, Ch.7
10	Cloud Storage Device, Usage Monitor, Resource Replication	Book 1, Ch.7
11	Specialized Cloud Mechanisms: Load Balancer	Book 1, Ch.8
12	SLA Monitor, Hypervisor	Book 1, Ch.8
13	Multi-Device Broker, Cloud Management Mechanisms	Book 1, Ch.8 and 9
14	Cloud Security Mechanisms: Encryption	Book 1, Ch.10
15	Hashing, Digital Signature	Book 1, Ch.10
16	Public Key Infrastructure (PKI)	Book 1, Ch.10
17	Identity and Access Management (IAM)	Book 1, Ch.10
18	Single Sign-On (SSO)	Book 1, Ch.10
Unit- III Cloud Computing Architecture		
19	Fundamental Cloud Architectures: Workload Distribution	Book 1, Ch.11
20	Resource Pooling	Book 1, Ch.11
21	Service Load Balancing	Book 1, Ch.11
22	Dynamic Scalability Architecture	Book 1, Ch.11
23	Advanced Cloud Architectures: Hypervisor Clustering	Book 1, Ch.12
24	Load Balanced Virtual Server Instances	Book 1, Ch.11
25	Zero Downtime and Dynamic Failure Detection and Recovery Architecture	Book 1, Ch.11
Unit-IV Working with Clouds		
26	Cloud Delivery Models: Cloud Provider	Book 1, Ch.14
27	Cloud Delivery Models: Consumer perspective	Book 1, Ch.14
28	Building and Working with IaaS service environments	Book 1, Ch.14
29	Building and Working with PaaS service environments	Book 1, Ch.14
30	Building and Working with SaaS service environments	Book 1, Ch.14
31	Business Cost Metrics	Book 1, Ch.15
32	Cloud Usage Cost Metrics	Book 1, Ch.15
33	Service Quality Metrics: Service Availability	Book 1, Ch.16
34	Service Reliability, Service Performance	Book 1, Ch.16
35	Service Scalability and Service Resiliency Metrics	Book 1, Ch.16

Unit-V Advanced Cloud Practices and Case Studies		
36	Industry Standards Organizations	Book 1, Appendix B
37	Data Center Facilities	Book 1, Appendix D
38	Cloud-Adapted Risk Management Framework	Book 1, Appendix E
39	Case Studies	Book 1, Appendix A

ADDITIONAL WEB RESOURCES

1.	**MOOC:** Introduction to Cloud Computing https://www.coursera.org/learn/introduction-to-cloud
2.	**NPTEL:** Video lectures on Cloud Computing Lecture series by Prof. Soumya Kanti Ghosh, Department of Computer Science and Engineering, IIT Kharagpur https://archive.nptel.ac.in/courses/106/105/106105167/

GRADING AND ASSESSMENT

- **Sessional-I** : 10 marks
- **Sessional**-II : 10 marks
- **Assignment**: 20 marks
- **Attendance**: 10 marks
- **Final Examination**: 100 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity**: MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions**: Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**

  Monday (12:55 PM - 01:45 PM)
  Friday (12:55 PM - 01:45 PM)

- **Contact Information**
  vishalika.it@mietjammu.in