COURSE HANDOUT

CLOUD COMPUTING (COM-701)

B.Tech-7th SEMESTER

ACADEMIC YEAR (2024-25)

Ms. Mehak Mengi

Assistant Professor

Department of Computer Science & Engineering

Department of Computer Science & Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

www.mietjmu.in

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
COM-701(A)	Cloud Computing and Services	PEC	3	2	1	0	50	100	150

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Articulate the main concepts, key technologies, strengths, limitations of cloud computing and the possible applications for state-of-the-art cloud computing.
CO2	Identify the architecture and infrastructure of cloud computing, including cloud delivery and deployment models.
CO3	Analyze the performance, scalability, and availability of the underlying cloud technologies and software.
CO4	Develop the core issues of cloud computing such as security, privacy, and interoperability.
CO5	Evaluate the appropriate cloud computing solutions and recommendations according to the applications used.

Section-A

Unit 1: Cloud Computing Overview: Origins of Cloud computing – Cloud components - Essential characteristics – On-demand self-service, Broad network access, Location independent resource pooling, Rapid elasticity, Measured service, Comparing cloud providers with traditional IT service providers, Roots of cloud computing. (06 Hrs.)

Unit 2: Cloud Insights: Architectural influences – High-performance computing, Utility and Enterprise grid computing, Cloud scenarios – Benefits: scalability, simplicity, vendors, security, Limitations – Sensitive information - Application development- security level of a third party - security benefits, Regularity issues: Government policies. (08 Hrs.)

Unit 3: Cloud Architecture-Layers and Models: Layers in cloud architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits, Infrastructure as a Service (IaaS), features of IaaS and benefits, Service providers, challenges, and risks in cloud adoption. Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing.

(08 Hrs.)

Section-B

Unit 4: Monitoring and Management: Architecture for Federated Cloud Computing, SLA management in cloud computing, performance prediction for HPC on cloud, Data Security in cloud. Legal issues in cloud computing. (08 Hrs.)

Unit 5: Applications: Best practices in architecting cloud applications in the AWS cloud, building Content Delivery Networks (CDN) using clouds, Resource Cloud Mashups.

(10 Hrs.)

Textbooks

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Cloud Computing Principles and Paradigms	Rajkumar Buyya, James Broberg, Andrzej Goscinski	Wiley Publishing	1st (2011)

2.	Cloud Computing: A practical approach	Anthony T.Velte , Toby J. Velte, Robert Elsenpeter	Tata McGraw-Hill	1st (2010)
3.	Cloud Security: A Comprehensive Guide to Secure Cloud Computing	Ronald L. Krutz, Russell Dean Vines	Wiley	1st (2010)

Reference Books

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Handbook of Cloud Computing	Borko Furht. Armando Escalante	Springer	1st (2010)
2	Cloud computing for Dummies	Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper	Wiley	2nd (2010)

COURSE PLAN		
Unit-I Cloud Computing Overview		
S.No.	**Topics**	**Recommended Books**
1	Cloud Computing Overview: Origins of Cloud Computing	Book 1, Ch.1
2	Cloud components	Book 2, Ch.2
3	Essential characteristics of Cloud Computing	Book 3, Ch.2
4	On-demand self-service in Cloud Computing	Book 3, Ch.2
5	Comparing cloud providers with traditional IT service providers,	Book 2, Ch.5
6	Roots of cloud computing	Ref. Book 1, Ch.2
Unit-II Cloud Insights		
7	Architectural influences – High-performance computing	Reference Book1, Ch.8
8	Utility computing	Book 1, Ch.1
9	Enterprise Grid Computing	Book 1, Ch. 1
10	Cloud scenarios – Benefits: scalability, simplicity, vendors, security	Book 1, Ch.2
11	Limitations – Sensitive information - Application development-security level of third party	Book 1, Ch.7
12	Security Benefits	Book 1, Ch.8
13	Regularity issues	Book 1, Ch.10
14	Government policies	Book1, Ch. 11
Unit-III Cloud Architecture- Layers and Models		
15	Layers in cloud architecture	Book 2, Ch.2

16	Software as a Service (SaaS), features of SaaS and benefits,	Book 2, Ch.3
17	Platform as a Service (PaaS), features of PaaS and benefits	Book 2, Ch.4
18	Infrastructure as a Service (IaaS), features of IaaS and benefits	Book 2, Ch.5
19	Service providers	Book 2,, Ch.6
20	Challenges, and risks in cloud adoption	Book 2, Ch.9
21	Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds	Book 2, Ch.7
22	Advantages of Cloud computing	Book 2, Ch.3
Unit-IV Monitoring and Management		
23	Federated Cloud Computing	Book 1, Ch.15
24	Architecture of Federated Cloud Computing	Book 1, Ch.15
25	SLA Overview	Book 1, Ch.16
26	SLA management in cloud computing	Book 1, Ch.16
27	HPC Introduction	Book 1, Ch. 17
28	Performance prediction for HPC on cloud	Book 1,Ch. 17
29	Data Security in Cloud	Book 1, Ch. 3
30	Legal issues in cloud computing	Book 1, Ch. 24
Unit-V Applications		
31	Introduction to AWS Architecture	Book 2, Ch. 5
32	Designing Scalable Applications	Book 3, Ch. 9
33	High Availability and Fault Tolerance	Reference Book 2, Ch. 12
34	Security Best Practices	Book 2, Ch.9
35	Introduction to CDNs	Book 1, Ch.8
36	Setting Up Amazon CloudFront	Book 2, Ch. 2
37	Building Content Delivery Networks (CDN) Using Clouds	Book 2, Ch. 5
38	Introduction to Cloud Mashups	Book 1, Ch. 8
39	Tools and platforms for building mashups	Book 1, Ch. 15
40	Implementing Resource Mashups on AWS	Book 2, Ch. 5

ADDITIONAL WEB RESOURCES

1.	https://www.youtube.com/watch?v=RWgW-CgdIk0 (Cloud Computing Tutorial for Beginners)
2.	https://www.youtube.com/watch?v=EN4fEbcFZ_E (Cloud Computing Full Course)
3.	**NPTEL** – Cloud Computing Course by Prof. Somya Kanti Ghosh (IIT Kharagpur) https://nptel.ac.in/courses/106105167

GRADING AND ASSESSMENT

- **Sessional Test**: 15 marks
- **Assignment**: 10 marks
- **Attendance**: 5 marks
- **Final Examination**: 70 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 (12:05 PM - 12:55 PM)
  Friday (12:05 PM - 12:55 PM)

- **Contact Information**

mehak.cse@mietjammu.in