



Kot Bhalwal, Jammu



Model Institute of Engineering
& Technology (Autonomous)
Course Handout

COURSE FILE

CLOUD COMPUTING (MCA-402 (A))

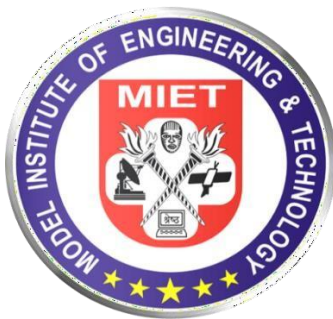
MCA-4th SEMESTER

ACADEMIC YEAR (2024-25)

Ms. Deepanshi

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



Dr. Arun K. Gupta Teaching-Learning Centre

Version 1.1



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| Course Code | Course Name | Course Type | Cd | L | T | P | Marks | | |
|-------------|-----------------|-------------|----|---|---|---|-----------|------------|-------|
| | | | | | | | Sessional | Final Exam | Total |
| MCA-402 (A) | Cloud Computing | PEC | 4 | 4 | 0 | 0 | 40 | 60 | 100 |

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 |

Unit-I 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 Hours)

Unit-II 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 third party - security benefits, Regularity issues: Government policies. (08 Hours)

Unit-III 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 Hours)

Unit- IV 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 Hours)

Unit-V Applications:

Best practices in architecting cloud applications in the AWS cloud, building Content Delivery Networks (CDN) using clouds, Resource Cloud Mashups. (10 Hours)

Textbooks

| S.No | Name of the Books | Name of the Author | Publisher Name | Edition (Pub.Yr.) |
|------|--|--|------------------|-------------------|
| 1 | Cloud Computing: Technology & Architecture | Thomas Erl, Zaigham Mahmood, and Ricardo Puttini | Pearson | 1st (2013) |
| 2. | Cloud Computing | Judith Hurwitz, Robin Bloor, Marcia Kaufman, and Dr. Fern Halper | Wiley Publishing | 2nd (2020) |

Reference Books

| S.No | Name of the Books | Name of the Author | Publisher Name | Edition (Pub.Yr.) |
|------|---------------------------------------|--|----------------------------|-------------------|
| 1 | Mastering Cloud Computing Foundations | Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi | Morgan Kaufmann Publishers | (2013) |



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CO-PO AND CO-PSO MATRIX

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| 1 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| 2 | 2 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 |
| 3 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 3 |
| 4 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 4 |
| 5 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 5 |



| COURSE PLAN | | |
|--|--|--|
| Unit-I Cloud Computing Overview | | |
| S.No. | Topics | Recommended Books |
| 1 | Evolution and History of Cloud Computing, | Book 1, Ch.1 |
| 2 | Introduction to Cloud Computing, Features of Cloud Computing | Book 1, Ch.1 |
| 3 | Cloud Computing for various users, | Reference Book 1, Ch.15 |
| 4 | Advantages of Cloud Computing | Book 2, Ch.1 |
| 5 | Limitations of Cloud Computing. | Book 2, Ch.1 |
| Unit-II Cloud Insights | | |
| 6 | Cloud Computing Architecture, | Reference Book1, Ch.10 |
| 7 | Cloud Architecture Components, | Book 1, Ch.10 |
| 8 | Virtualization Basics | Book 1, Ch.10 |
| 9 | Hypervisors and Virtual Machine, | Book 1, Ch.10 |
| 10 | Cloud Storage and Data Management | Book 1, Ch.10 |
| 11 | Network and Security Considerations in Cloud. | Book 1, Ch.5 |
| Unit-III Cloud Architecture-Layers and Models | | |
| 12 | Defining Infrastructure as a Service (IaaS) | Book 1, Ch.3 |
| 13 | IaaS workloads - Pods | https://www.bacancytechnology.com/blog/netflix-aws-migration https://www.bacancytechnology.com/blog/airbnbs-aws-migration |
| 14 | Aggregation – Defining Platform as a Service (PaaS) - | Book 1, Ch.3 |
| 15 | Defining Software as a Service (SaaS) | Book 1, Ch.3 |
| 16 | SaaS characteristics - Open SaaS | https://thinklogic.com/post/cloud-migration-case-study-how-capital-one-successfully-transitioned-to-the-cloud |
| 17 | SaaS characteristics - Salesforce.com | Book 1, Ch.3 |
| 18 | SaaS characteristics CRM SaaS - | Book 1, Ch.3 |
| 19 | Defining Identity as a Service (IDaaS) | Book 1, Ch.4 |
| 20 | Identity - Authorization markup languages | Book 1, Ch.4 |



| Unit-IV Monitoring and Management: | | |
|--|---|---|
| 21 | Overview of Security Issues, | Book 1, Ch.11 |
| 22 | Infrastructure Security: | Book 1, Ch.11 |
| 23 | SLA management in cloud computing | Book 1, Ch 11 |
| 24 | Network level security, | Book 1, Ch.11 |
| 25 | Host level security, | Book 1, Ch.11 |
| 25 | Application-level security, | Book 1, Ch.11 |
| 26 | Data security and Storage | https://cybersrcc.com/infrastructure-threat/ |
| 27 | Challenges and Risks of Cloud Computing Platforms | Book 1, Ch.11 |
| 28 | Challenges and Risks of Cloud Services. | Book 1, Ch.11 |
| Unit-V Cloud Computing Applications | | |
| 29 | Cloud-Based Productivity Tools (e.g., Google Workspace, Microsoft Office 365) | Reference Book1, Ch.5 |
| 30 | Cloud-Based Development and Deployment Tools | Reference Book1, Ch.5 |
| 31 | Big Data and Cloud Computing, | Reference Book 1, Ch.6 |
| 32 | Building Content Delivery Networks (CDN) using clouds | Reference Book 1, Ch.7 |
| 33 | Cloud-Native Applications | Book 1, Ch.7 |
| 34 | Cloud Computing in Business and Education. | https://www.mendix.com/blog/why-cloud-native-applications-are-the-future-of-software/ |

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:** 20 marks
- **Assignment:** 10 marks
- **Attendance:** 10 marks
- **Final Examination:** 60 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**
Deepanshi.cse@mietjammu.in



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