**AY 2023-24**

## Course Information

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|---|---|
| **Programme** | B.Tech. (Information Technology) |
| **Class, Semester** | Third Year B. Tech., Sem V |
| **Course Code** | |
| **Course Name** | Open Elective - 1: Cloud Computing System |
| **Desired Requisites:** | Computer Networks |

| Teaching Scheme | | Examination Scheme (Marks) | | | |
|---|---|---|---|---|---|
| **Lecture** | 3 Hrs/week | **MSE** | **ISE** | **ESE** | **Total** |
| **Tutorial** | - | 30 | 20 | 50 | 100 |
| | - | **Credits: 3** | | | |

## Course Objectives

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|---|---|
| **1** | To introduce fundamentals of virtualization |
| **2** | To impart various service and deployment model in cloud computing |
| **3** | To acquaint the significance of virtualization in data centre |

## Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

| CO | Course Outcome Statement/s | Bloom's Taxonomy Level | Bloom's Taxonomy Description |
|---|---|---|---|
| **CO1** | Comprehend the fundamentals of cloud computation | II | Understanding |
| **CO2** | Choose virtualization techniques to deploy the service on cloud infrastructure | III | Applying |
| **CO3** | Analyze service models for data centre applications | IV | Analysing |

| Module | Module Contents | Hours |
|---|---|---|
| I | **Introduction to Cloud Computing**<br>Virtualization and Cloud Computing, Cloud Reference Model: IAAS, PAAS, SAAS, Cloud Deployment Model: Public Cloud, Private Cloud and Hybrid Cloud, Cloud Platforms in Industry | 7 |
| II | **Virtualization**<br>Hosted and Bare-Meta, Server Virtualization, Desktop Virtualization, Application Virtualization, Storage Virtualization | 6 |
| III | **Network Functions**<br>Public Cloud Networking: Route53, Content Delivery Networks, Resilience Infrastructure, Virtual Network Functions: Cloud Firewall, DNS, Load Balancers, Intrusion Detection Systems | 6 |
| IV | **Virtual Private Clouds (VPC)**<br>VPC fundamentals, Public and Private Subnets, Security Groups, Network Access Control List, Network Address Translation. | 7 |
| V | **Cloud Management**<br>Service Management in Cloud Computing, Data Management in Cloud Computing, Resource Management in Cloud | 7 |

| VI | Open Source and Commercial Clouds, Cloud Simulator, Research trend in Cloud Computing, Fog Computing | 6 |
|---|---|---|
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| Text Books | |
|---|---|
| 1 | Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, *"Mastering cloud computing"*, Mc Graw Hill Education, 3rd Edition, 2011 |
| 2 | Thomas Erl, Zaigham Mahmood and Ricardo Puttini, *"Cloud Computing: Concepts, Technology & Architecture"*, Pearson, 1st Edition, 2010 |

| References | |
|---|---|
| 1 | Richardo Puttini, Thomas Erl, and Zaigham Mahmood, *"Cloud Computing: Concepts, Technology & Architecture"*, Pearson Prentice Hall, 2nd edition, 2013 |
| 2 | Srinivasan, J. Suresh, *"Cloud Computing: A practical approach for learning and implementation"*, Pearson, 2nd Edition, 2012 |

| Useful Links | |
|---|---|
| 1 | Module: I, II, IV, V, VI <br> https://nptel.ac.in/content/syllabus_pdf/106105167.pdf |
| 2 | https://aws.amazon.com/ |

| CO-PO Mapping | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Programme Outcomes (PO) | | | | | | | | | | | | PSO | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| **CO1** | 1 | | 2 | | | | | | | | | | 2 | | |
| **CO2** | | | 3 | | | | | | | | | | | | |
| **CO3** | 2 | | | | | | | | | | | | | 3 | |

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High
Each CO of the course must map to at least one PO.

| Assessment |
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| The assessment is based on MSE, ISE and ESE. <br> MSE shall be typically on modules 1 to 3. <br> ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO. <br> ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6. <br> For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing) |