With effect from the A.Y 2019-20

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SYLLABUS FOR B.E VII SEMESTER

DISTRIBUTED & CLOUD COMPUTING

Instructor's

MSV Sashi Kumar

Garima Jain

<table>
<thead>
<tr>
<th>Course Objectives</th>
<th>Course Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students should be able to</td>
<td>At the end of the course, students will be able to</td>
</tr>
<tr>
<td>• Explain distributed system and cloud models</td>
<td>1. Design service and deployment models that enable Distributed computation over Cloud</td>
</tr>
<tr>
<td>• Apply distributed computational model and understand the need for cloud computing.</td>
<td>2. Analyze the need for virtualization in a cloud environment and learn to apply it across compute memory and storage levels</td>
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<tr>
<td></td>
<td>3. Develop distributed computation model over large datasets using parallel and distributed programming approaches over cloud platforms.</td>
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<tr>
<td></td>
<td>4. Analyze the security issues across SPI infrastructure and evaluate the role of IAM and Privacy in cloud</td>
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<tr>
<td></td>
<td>5. Extend the Cloud enabling technologies for Internet of Things, Professional &amp; Social Media</td>
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UNIT I

Distributed System Models & Enabling technology: Scalable computing over the internet, Technologies for network based system, System models for distributed & cloud, Software environments for distributed & Cloud.

Time and Global States: Introduction, Clocks events and process states, synchronizing physical clocks, Logical clocks, Global states


UNIT II

Virtual Machines and Virtualization of Cluster and Data Centres: Levels of Virtualization, Virtualization structures/Tools and Mechanism, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resources Management, Virtualization Data-Centre Automation
UNIT III

Service Oriented Architecture for Distributed Computing: Services & SOA, Message Oriented Middleware, Workflow in SOA.

Cloud Programming & Software Environments: Features of Cloud & Grid, Parallel & Distributed programming paradigms, Programming support of Google Cloud, Amazon AWS & Azure. Case Studies; OpenStack & Aneka

UNIT IV


UNIT V

Trust Management & Green Cloud

Suggested Book:


Reference Books:


Online Resources:

1. https://onlinecourses.nptel.ac.in/noc18_cs45/
2. https://cloud.google.com/load-balancing/docs/
4. https://www.docker.com/resources/what-container
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SYLLABUS FOR B.E VII SEMESTER

DISTRIBUTED & CLOUD COMPUTING LAB

<table>
<thead>
<tr>
<th>Instruction : 2 Hrs / Week</th>
<th>SEE Marks : 50</th>
<th>Course Code: PE 711CS</th>
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<tbody>
<tr>
<td>Credits : 1</td>
<td>CIE Marks : 25</td>
<td>Duration of SEE : 3 Hrs</td>
</tr>
<tr>
<td>Instructor’s</td>
<td>MSV Sashi Kumar</td>
<td>M Shanmugha Sundari</td>
</tr>
</tbody>
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<td>Students should be able to</td>
<td>At the end of the course, students will be able to</td>
</tr>
<tr>
<td>● Implement distributed</td>
<td>1. Implement a distributed transaction model</td>
</tr>
<tr>
<td>transactions</td>
<td>2. Launch and run a highly available web application on Amazon cloud platform</td>
</tr>
<tr>
<td>● Install, configure and</td>
<td>3. Deploy and develop scalable compute model using Distributed Storage</td>
</tr>
<tr>
<td>deploy applications using</td>
<td>4. Develop full stack application using Google cloud</td>
</tr>
<tr>
<td>various cloud platforms</td>
<td>5. Develop a end to end application over a Cloud environment</td>
</tr>
</tbody>
</table>

**Programming Exercise:**

1. Implement a 2PC for distributed transaction management.
2. Design a Web service using Simple Object Access Protocol (SOAP)
3. Hosting a static website on Amazon AWS
4. Deploying a Node.js Web Application on AWS
5. Installation and configuration of Hadoop using Docker Container
6. Implement a distributed application on Hadoop framework to count word frequency with Map Reduce
7. Analyzing Big Data using Hadoop
8. Use native MySQL connections from Google App Engine to Google Cloud SQL
9. AngularJS CRUD application for Google App Engine
10. Final Project to develop a case study on Cloud

**Suggested Book:**


**Reference Books:**

Online Resources:
2. https://onlinecourses.nptel.ac.in/noc18_cs45/
5. https://www.docker.com/resources/what-container