Course Title: Cloud Computing

An Institute Elective Course (UG3 / UG4)
By: Dr. Shridhar G. D

Course Level: L1   L-T-P-C: 3-2-0-4

Pre-requisite: Operating Systems, Computer Networks.

1. **Outline:** Cloud Computing is a new paradigm and it has become one of the popular techniques adopted by both industry and academia providing a flexible and efficient way to store and retrieve the data files, managing the infrastructure and optimum utilization of the resources.

2. **Objectives:** The Cloud Computing course mainly focusses on the following objectives.

    *   Cloud Computing basics and its usage when compared to traditional scenarios.
    *   Different types of computing capabilities and its comparison with Cloud.
    *   Resources mapping and utilization in Cloud Computing environment / platform.
    *   Role of Cloud Computing in providing different service models and deployment models.
    *   Era of Cloud from Virtualization to Containers.
    *   Implementing case studies / minor projects.
    *   Good scope for publishing papers in reputed Journals / Transactions / Top Conferences.

3. **Course Outline (Topics):** The following list of topics is tentative. Based on available time slots, some topics may be dropped or added or reordered.

    Introduction to Cloud Computing, Cloud Computing Delivery Models, Service Models. Open Source and Industry case studies of Cloud (Amazon, IBM and Google Cloud, etc.). Virtualizations as an enabler for cloud computing infrastructure, Cloud Application Design & Development, Containers and Micro-services. Best architecting practices in cloud environment. Functions as a Service (FaaS) model and its applications. Cloud infrastructure automation using CHEF / Ansible.

4. Books:
    *   George Reese, CloudApplicationArchitectures, O'ReillyPublications,2009.
    *   Rajkumar Buyya, Christian Vecchiola, and Thamarai Selvi Mastering Cloud. Computing McGraw Hill Education.
    *   Arshadeep Bagha and Vijay Madisetti, Cloud Computing: A Hands on Approach, Universities Press, 2014.
    *   Tim Mather,Subra Kumaraswamy, Cloud Security and Privacy, O'Reilly, 2009.
    *   Good Transactions, Journal and Conference papers.

5. Pre-Requisites:
- Fair knowledge on Operating Systems, Computer Networks.
- Knowledge on any one scripting / programming language.

6. Course Work:
Assignments and the term project should include explanatory/clear comments as well as a short report describing the approach, detailed analysis, and discussion/conclusion.

    10%   Mid-Exam-1
    10%   Mid-Exam-2
    30%   End-Exam
    10%   Quiz
    20%   Assignments / Seminars / Case Study
    20%   Term Project + Journal / Conference paper

7. Industry Impact:
Most of the big IT companies like Amazon, Google, Microsoft, Facebook, IBM, etc. `are involved in providing different kinds services in the Cloud domain. As every firm / company is migrating towards cloud and hence there is huge opportunity for starts-ups and new entrepreneurs.

8. List of Companies Working On Related Topics:
Amazon, Google, Microsoft, IBM, etc. are helping many clients over the globe to migrate in to the Cloud domain. They are also involved in cloud based research for upcoming integrations.

9. Course Ethics:
Please note down the following activities leading to a fair academic honesty:
- All class work to be done independently.
- It is best to try to solve problems on your own, since problem solving is an important component of the course, and exam problems are often based on the outcome of the assignment problems / Quiz and case studies.
- You are allowed to discuss class material, assignment problems, and general solution strategies with your classmates.
- Think innovative and come up with optimal solution in your course projects.
- You must clearly and explicitly cite all outside sources and materials that you made use of.

Course Plan Submitted By
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