CS597: Cloud Computing

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About the Instructor

- Associate Professor in Computer Science, since August 2013
- Director – InfoLab at BSU

- Previously, was Researcher at:
  - eBay (2012-2013)
  - GE (2011)
  - Microsoft (2008-2010)
  - IBM (2005-2007)

- PhD from University of Southampton, UK - 2006

  Advisors:
  - Prof. A.J.G. (Tony) Hey, Vice President, Microsoft Research, Redmond, USA
  - Prof. David De Roure, University of Oxford, UK

About InfoLab

★ Research Areas

- Parallel and Distributed Databases
- Real time analytics
- Cloud Computing and Services Architecture
- Machine Learning

★ Collaborators

- Microsoft Research (Redmond)
- Oregon State University
- Oakridge National Lab
- Idaho National Lab

InfoLab is hiring graduate and undergraduate students

You are welcome to Apply!

Part I – SOA and ESB

1. Introduction to SOA and ESB

2. Fundamentals of SOA – SOAP, WSDL, WS-Security

3. Building Web Services (including RESTful Services) using Spring framework, JAXRPC, JAX-WS, .Net

4. Using ESB to manage an ecosystem of enterprise services.

Part II – Cloud Computing

- Cloud Computing and Introduction to private Cloud at Boise State
- Storage as a Service
- Database as a Service
- Compute as a Service
- Messaging as a Service SaaS, PaaS, IaaS - Cloud Infrastructures and Comparison

Part III – Case Studies in Cloud Computing

- Case Study AWS
- Case Study Azure
- Case Study OpenStack
- Case Study SalesForce

Part IV – Deploying and Securing Clouds

- Puppet for Cloud Management
- Chef for Cloud Management
- Hypervisors (KVM and VMWare)
- Deploying Private and Hybrid Cloud
- Cloud Computing SLA
- Cloud Security

Part V – Projects and Presentations

1) **Project I**

- Develop a BLOB Service offering using a cloud computing framework and create a Tumblr™ like service for storing contents.

1) **Project II**

Each student would:

- Propose a project involving Cloud Computing technologies (About 500 words for project proposal)
- Code and release the software (Alpha and Beta Releases)
- Write a project report (at least 1000 words or 2 pages)
- Make a presentation to the class

Course Evaluation

Evaluation

- Weekly Quizzes – 300 points (20%)
- Program Assignments: 500 points (33.3%)
- Project I: 300 points (20%)
- Project II**:** 400 points (26.7%)

Grades :

- ✧ 890 <= A- < 900 <= A < 970 <= A+
- ✧ 790 <= B- < 800 <= B < 870 <= B+
- ✧ 690 <= C- < 700 <= C < 770 <= C+
- ✧ 590 <= D- < 600 <= D < 670 <= D+
- ✧ F < 590

I reserve the right to revise these ranges to relax the criterion

Textbook and References

Text Book

- There is **NO SINGLE TEXT BOOK** for the Course
- IF HAVING A TEXBOOK IS A MUST FOR YOUR LEARNING STYLE, PLEASE CANCEL YOUR ENROLLMENT.

References:

1. RESTFUL Java with JAX-RS 2.0, Bill Bruke
2. SOA Design Patterns, Thomas Erl
3. SOA Patterns, Arnon Rotem-Gal-Oz
4. OpenStack Operations Guide, Tom Fifield
5. Mastering Cloud Computing: Foundations and Applications Programming, Rajkumar Buyya
6. Chef Infrastructure Automation Cookbook, Matthias Marschall

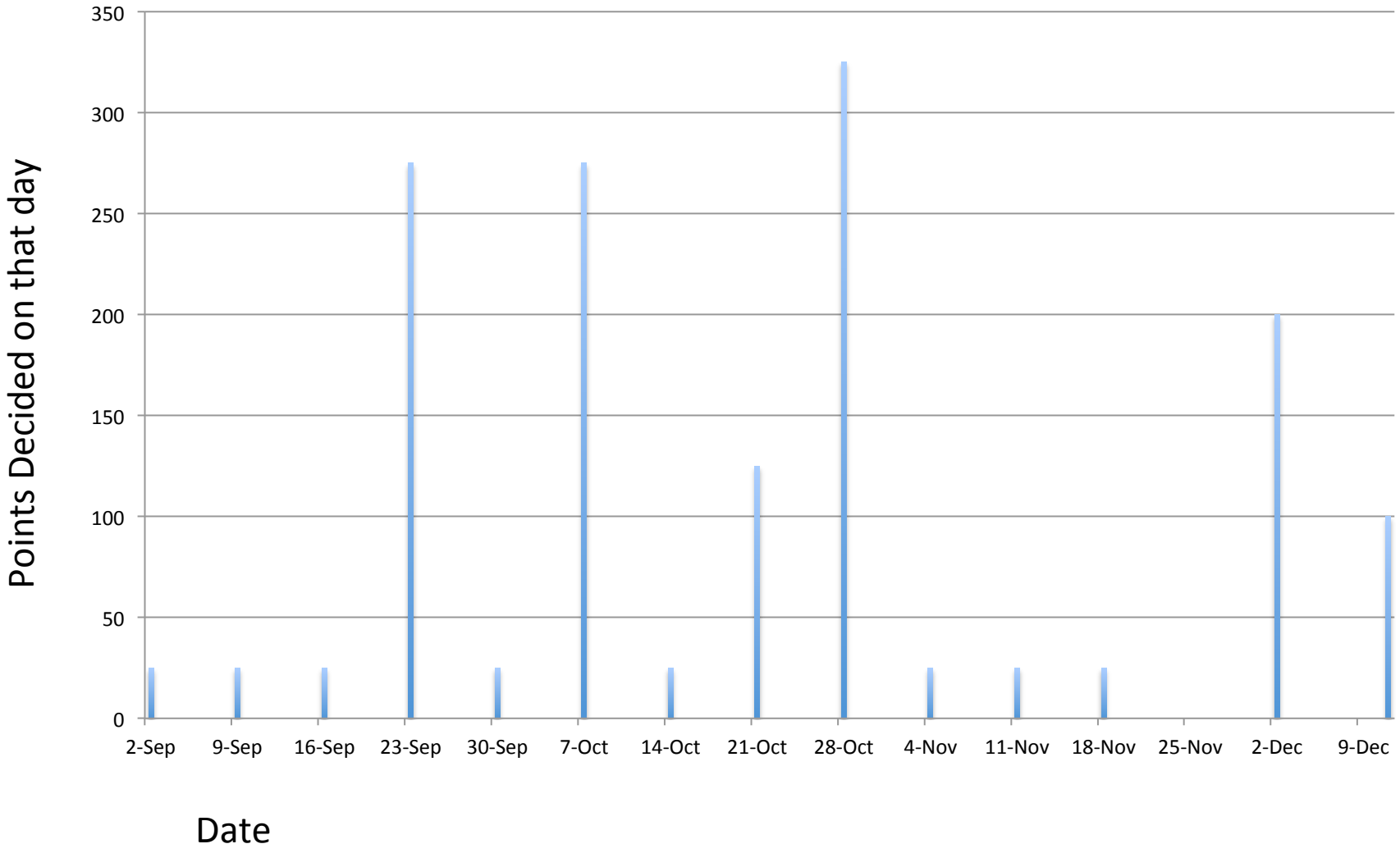
Numerous research papers, online articles and videos will be provided to aide learning.

Schedule

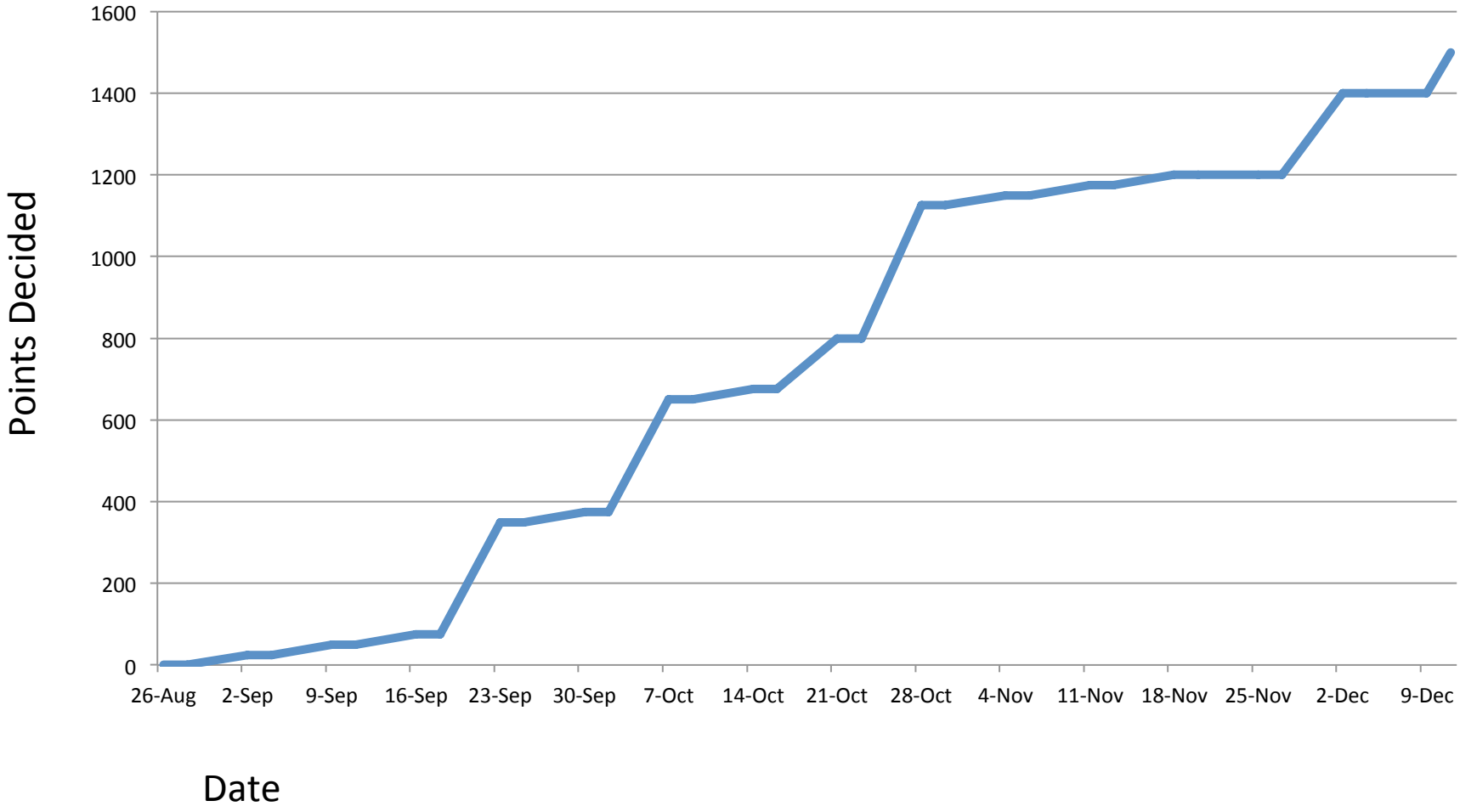
Course: CS-597 **By - Dr. Vijay Dialani** **Fall 2014**

Version	1	
Published Date	8/1/14	
Date	**Lecture Topic**	**Deadlines** **Points**
26-Aug	Introduction to the Course Content, Objectives and Evaluations	
28-Aug	Introduction to SOC and Web Services	
2-Sep	SOAP based Services	**Quiz -1 [25 points]** 25
4-Sep	REST based Services	
9-Sep	Developing Web Services - Part I	**Quiz-2 [25 points]** 25
11-Sep	Developing Web Services - Part II	
16-Sep	Design Patterns for Web Services	**Quiz-3 [25 points]** 25
18-Sep	Enterprise Service Bus	
23-Sep	Introduction to Cloud Computing	**Quiz-4 [25 points], Assignment-1 [250 points]** 275
25-Sep	Storage as a Service	
30-Sep	Database as a Service	**Quiz-5 [25 points]** 25
2-Oct	Compute as a Service	
7-Oct	Messaging as a Service	**Quiz-6 [25 points], Assigment-2 [250 points]** 275
9-Oct	SaaS, PaaS, IaaS - Cloud Infrastructures and Comparison	
14-Oct	Case Study AWS	**Quiz-7 [25 points]** 25
16-Oct	Case Study Azure, OpenStack, VMWare	
21-Oct	Multi-tenancy and Elastic Services	**Quiz-8 [25 points], Project-II Proposal [100 points]** 125
23-Oct	Monitoring Cloud Services and Deployments	
28-Oct	Puppet for Cloud Management	**Quiz-9 [25 points], Project I [300 points]** 325
30-Oct	Chef for Cloud Management	
4-Nov	Hypervisors	**Quiz-10 [25 points]** 25
6-Nov	Deploying Private and Hybrid Cloud	
11-Nov	Cloud Computing SLA	**Quiz-11 [25 points]** 25
13-Nov	Cloud Security	
18-Nov	Research Papers / External Talk	**Quiz-12 [25 points]** 25
20-Nov	Research Papers / External Talk	
25-Nov	**Thanksgiving Week**	
27-Nov	**Thanksgiving Week**	
2-Dec	Project Presentations by Students	**Project-II code [200 points], Due 12/01** 200
4-Dec	Project Presentations by Students	
9-Dec	Project Presentations by Students	
11-Dec	Project Presentations by Students	**Presentation, Participation** 100
	No Final Exam	
		Total Points 1500

Progress Graphs



Evaluation Curve



Assignments

- All assignments are to be submitted using submit command on onyx
- Each assignment needs to be separate project folder
- Each assignment should be named as p#, for example p1, p2, p3and so on
- Each assignment project should contain a pom.xml, which should compile the project using maven
- Each project should have a run.sh, a shell script required to run the project
- Each assignment should have a README.txt file that should provide a description of your approach, if you wish to use a richer format README.docx file is allowed.

- **NOTE: Each assignment should be submitted by due date**
- **NOTE: Late submissions are permitted for a period of 48 hours and are penalized 20% of the points.**

Software Tools

Libraries and VMs will be provided.

IDE: Eclipse

– Download the “Eclipse Standard 4.3 version” from
http://www.eclipse.org/downloads/

Build System: Maven

– Download from http://maven.apache.org/download.cgi

SCM: git – install git from https://help.github.com/articles/set-up-git

A Typical Class

Discussion of online content
-OR-
Discussion of Assignment

10 minutes

Presentation on Topic of the Lecture
Part-I

35 minutes

Quiz (every Tuesday)
-OR-
Thought Experiment (every Thursday)

45 minutes

Presentation on Topic of the Lecture
Part-II

1 hour 10 minutes

Video lectures for next class
-OR-
Description of the next assignment

1 hour 15 minutes

Honor Code

Under this courses honor code, you are expected to submit your own work in this course, including homeworks, projects, and exams. On many occasions when working on homeworks and projects, it is useful to ask others (the instructor or other students) for hints or debugging help, or to talk generally about the written problems or programming strategies. Such activity is both acceptable and encouraged, but you must indicate in your submission any assistance you received. Any assistance received that is not given proper citation will be considered a violation of the Honor Code. In any event, you are responsible for understanding and being able to explain on your own all written and programming solutions that you submit. The course staff will pursue aggressively all suspected cases of Honor Code violations, and they will be handled through official University channels.[1]

[1] Based on honor code used by Prof. Shivnath Babu

Channels of Communication

For attendees of the course:

- Blackboard

To Contact Instructor:

Email: vijaydialani@boisestate.edu

Office hours: 3pm to 4pm on Tuesday, or by appointment

Question and Answer Session

Thank you