SCHEME OF COURSEWORK

Course Details:

COURSE TITLE	**Cloud Computing**		
COURSE CODE	**15CT1137**	**L T P C**	**3 0 0 3**
PROGRAM	**B.TECH**		
SPECIALIZATION	**IT**		
SEMESTER	**VII**		
PRE REQUISITES	**Computer Networks, Mobile Communications**		
COURSES TO WHICH IT IS A PRE REQUISITE	**N/A**		

Course Outcomes (COs):

CO – 1	Summarize importance of cloud computing in real world
CO – 2	Identify applications that can be integrated using cloud services.
CO - 3	Evaluate cloud based applications.
CO - 4	Understand the security issues in cloud services.
CO - 5	Identify the cloud services managing.

Program Outcomes (POs):

A graduate of Computer Science and engineering will be able to

PO-1	Graduates will be able to apply the knowledge of mathematics, science, engineering fundamentals and principles of Computer Science & Engineering to solve complex problems in different domains
PO-2	Graduates can identify, formulate, study contemporary domain literature and analyse real life problems and make effective conclusions using the basic principles of science and engineering
PO-3	Graduates will be in a position to design solutions for Engineering problems requiring in depth knowledge of Computer Science and design system components and processes as per standards with emphasis on privacy, security, public health and safety
PO-4	Graduates will be able to conduct experiments, perform analysis and interpret data as per the prevailing research methods and to provide valid conclusions
PO-5	Graduates will be able to select and apply appropriate techniques and use modern software design and development tools. They will be able to predict and model complex engineering activities with the awareness of the practical limitations
PO-6	Graduates will be able to carry out their professional practice in Computer Science & Engineering by appropriately considering and weighing the issues related to society and culture and the consequent responsibilities
PO-7	Graduates would understand the impact of the professional engineering solutions on environmental safety and legal issues

PO-8	Graduates will transform into responsible citizens by adhering to professional ethics
PO-9	Graduates will be able to function effectively in a large team of multidisciplinary streams consisting of persons of diverse cultures without forgetting the significance of each individual's contribution
PO-10	Graduates will be able to communicate effectively about complex engineering activities with the engineering community as well as the general society, and will be able to prepare reports
PO-11	Graduates will be able to demonstrate knowledge and understanding of the engineering and management principles and apply the same while managing projects in multidisciplinary environments
PO-12	Graduates will engage themselves in self and life-long learning in the context of rapid technological changes happening in Computer Science and other domains

Course Outcome versus **Program Outcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		3		2	3		2					2
CO2				3	2					2		
CO3	2	3			3	2		2				
CO4		3		3								
CO5	2	2		2	3		2				2	

3 - Strongly correlated, 2 - Moderately correlated, Blank - No correlation

Course Outcome versus **Program Specific Outcomes:**

COs	PSO1	PSO2	PSO3
CO1	2		
CO2	2	2	
CO3	2	2	
CO4	2		3
CO5	2		3

Assessment Methods	Assignment / Quiz / Mid-Test

Teaching – Learning and Evaluation

Week	Topic/Contents	Course Outcomes	Sample Questions	Teaching learning strategy	Assessment Method & Schedule
1	Where Are We Today, What Is Cloud Computing, Cloud Deployment Models, Private vs. Public Clouds	**CO1**	1) What are Cloud Deployment models? Explain. 2) Why Cloud Computing is important today?	Lecture / Discussion	Assignment-1, Test- 1 Quiz-1

2	Business Drivers for Cloud Computing, Introduction to Cloud Technologies	**CO1**	1) What are the different Cloud service models? Explain. 2) Draw and explain software as service model.	Lecture / Discussion	Assignment-1, Test- 1 Quiz-1
3	Storage as a Service: Amazon Storage Services, Compute as a Service: Amazon Elastic Compute Cloud (EC2), HP Cloud System Matrix, Cells-as-a-Service.	**CO1**	1) Explain about Amazon S3(simple Storage Service) in brief. 2) Explain basic platform features of HP cloud system matrix.	Lecture / Discussion	Assignment-1, Test- 1 Quiz-1
4	Windows Azure, A "Hello World" Example, Example: Passing a Message, Azure Test and Deployment, Technical Details of the Azure Platform	**CO2**	1) Explain about Azure Deployment Process in brief. 2) Discuss about Techincal details of Azure Platform.	Lecture / Discussion	Assignment-1, Test- 1 Quiz-1
5	Azure Programming Model, Using Azure Cloud Storage Services, Handling the Cloud Challenges, Designing Pustak Portal in Azure, Google App Engine.	**CO2**	1) How to Handle scalability and security Challenges in Cloud? 2) How to develop a google app engine application? Describe stepwise.	Lecture / Discussion	Assignment-1, Test- 1 Quiz-1

6	Platform as a Service: Storage Aspects, Apache Hadoop, Mashups. CRM as a Service, Salesforce.com, Social Computing Services, Document Services: Google Docs.	**CO2**	1) Explain about IBM SmartCloud in detail? 2) Explain about MapReduce model with a neat diagram.	Lecture / Discussion	Assignment-1, Test- 1 Quiz-1
7	Scalable Data Storage Techniques, MapReduce Revisited, Rich Internet Applications	**CO3**	1) Exaplain about any 2 techniques of scaling the storage. 2) Explain about RIA development environment in detail.	Lecture / Discussion	Assignment-1, Test- 1 Quiz-1
8	Scaling Computation, Scale Out versus Scale Up, Amdahl's Law, Scaling Cloud Applications with a Reverse Proxy Hybrid Cloud	**CO3**	1) How to scale cloud applications with reverse proxy? 2) Differentiate scale out and scale-up?	Lecture / Discussion	Assignment-1, Test- 1 Quiz-1
9	Test-1				
10	Hybrid Cloud & Cloud Bursting: OpenNebula, Scaling Storage, CAP Theorem, Implementing Weak Consistency, Consistency in NoSQL Systems, Multi-Tenancy, Multi-Tenancy Levels, Tenants and Users, Authentication		1) Explain CAP theorem? 2) what is multi-tenancy? What are the different levels of multi-tenancy? Explain.	Lecture / Discussion	Assignment-2, Test- 2 Quiz-2

11	Implementing Multi-Tenancy: Resource Sharing, Case Study: Multi-Tenancy in Salesforce.com, Multi-Tenancy and Security in Hadoop.	**CO3**	1) How to implement multi-tenancy with the help of resource sharing method? 2) Explain about HDFS Security.	Lecture /Discussion	Assignment-2, Test- 2 Quiz-2
12	Cloud Security Requirements and Best Practices, Physical Security, Virtual Security, Risk Management, Risk Management Concepts, Risk Management Process	**CO4**	1) What are the different practices used to protect the security in Cloud? 2) Explain about risk management process in detail?	Lecture / Discussion	Assignment-2, Test- 2 Quiz-2
13	Security Design Patterns, Defense in Depth, Honeypots, Sandboxes, Network Patterns, Common Management Database	**CO4**	1) what are the security design patterns in Cloud computing? 2)What are the network patterns in cloud computing?	Lecture / Discussion	Assignment-2, Test- 2 Quiz-2
14	Security Design for a PaaS System, Security Architecture Standards, SSE-CMM, Legal and Regulatory Issues	**CO4**	1) Explain about security design in PaaS system with a neat diagram? 2) What are the legal & regulatory issues in cloud computing?	Lecture / Discussion	Assignment-2, Test- 2 Quiz-2
15	Selecting a Cloud Service Provider, Cloud Security Evaluation Frameworks	**CO4**	1) What are the security criteria to be considered in selecting a cloud service provider? 2) What is Cloud security Alliance(CSA)?	Lecture /Discussion	Assignment-2, Test- 2 Quiz-2

16	Managing IaaS, Managing PaaS, Managing SaaS, Other Cloud-Scale Management Systems	**CO5**	1) What is self-service monitoring? Explain in brief? 2) Explain about right scale Cloud	Lecture / Discussion	Assignment-2, Test- 2 Quiz-2

			management platform with a neat diagram?		
17	Server Virtualization, Two Popular Hypervisors, Storage Virtualization, Grid Computing, Other Cloud-Related Technologies.	**CO5**	1) What is server Virtualization? 2)Explain about Trap and emulate virtualization.	Lecture / Discussion	Assignment-2, Test- 2 Quiz-2
18	Test-2				