CLOUD COMPUTING

II Semester: CSE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
BCSC18	**Elective**	3	0	0	3	30	70	100
Contact Classes: 45	**Total Tutorials: Nil**	**Total Practical Classes: Nil**				**Total Classes: 45**		

I. COURSE OVERVIEW:

This course enables students to learn a method of computing where a shared group of resources such as file storage, web servers, data processing services and applications are accessed via the internet. Students gain knowledge about how resources are housed in data centers around the world and are available to any person or device connected to the web.

II. COURSE OBJECTIVES:

The students will try to learn:

I. The concepts of cloud computing for developing the cloud applications.
II. The task scheduling algorithms and virtualization.
III. The security issues in cloud environments.
IV. The broad perceptive of cloud architecture and model.
V. The importance of various applications of cloud computing.

III. COURSEOUTCOMES:

After successful completion of the course, students should be able to

CO 1	**Describe** the principles of Parallel and Distributed Computing and evolution of cloud computing from existing technology	Understand
CO 2	**Implement** different types of Virtualization technologies and Service Oriented Architecture systems	Understand
CO 3	**Elucidate** the concepts of NIST Cloud Computing architecture and its design challenges	Apply
CO 4	**Analyses** the issues in Resource provisioning and Security governance in clouds	Analyze
CO 5	**Choose** among various cloud technologies for implementing applications.	Apply

IV.SYLLABUS:

MODULE-I: INTRODUCTION (10)

Introduction: Definition, Characteristics, Benefits, challenges of cloud computing, cloud models: Service IaaS (infrastructure as service), PaaS (platform as a service), SaaS (software as a service), deployment models-public, private, hybrid, community; Types of cloud computing: Grid computing utility computing, cluster; computing Cloud services: Amazon, Google, Azure, online services, open-source private clouds, SLA; Applications of cloud computing: Healthcare, energy systems, transportation, manufacturing, education, government, mobile communication, application development.

MODULE-II: CLOUD ARCHITECTURE, PROGRAMMING MODEL (09)

Edge detection, Edge detection performance, Hough transform, corner d Cloud Architecture, programming model: NIST reference architecture, architectural styles of cloud applications, single, multi, hybrid cloud site, redundant, non-redundant, 3 tier, multitier architectures; Programming model: Compute and data intensifications.

MODULE-III: CLOUD RESOURCE VIRTUALIZATION (08)

Cloud resource virtualization: Basics of virtualization, types of virtualization techniques, merits and demerits of virtualization, Full vs Para - virtualization, virtual machine monitor/hypervisor. Virtual machine basics, taxonomy of virtual machines, process vs system virtual machines

MODULE-IV: CLOUD RESOURCE MANAGEMENT AND SCHEDULING (09)
Cloud Resource Management and Scheduling: Policies and mechanisms for resource management, resource bundling, combinatorial, fair queuing, start time fair queuing, borrowed virtual time, cloud scheduling subject to deadlines, scheduling map reduce applications subject to deadlines, resource management and application scaling.

MODULE-V: CLOUD SECURITY (08)
Cloud Security: Risks, privacy and privacy impacts assessments; Multi-tenancy issues, security in VM, OS, virtualization system security issues and vulnerabilities; Virtualization system-specific attacks: Technologies for virtualization-based security enhancement, legal.

V. TEXT BOOKS:

1. Theodor Richardson, Charles N Thies, Secure Software Design, Jones & Bartlett, 2013.
2. Kenneth R. van Wyk, Mark G. Graff, Dan S. Peters, Diana L. Burley, "Enterprise Software Security, Addison Wesley", 1st Edition, 2014.

VI. REFERENCE BOOKS:

1. W. Stallings, Cryptography and network security: Principles and practice, Prentice Hall, 4th Edition, 2005.
2. C. P. Pfleeger, S. L. Pfleeger, "Security in Computing", Prentice Hall, 5th Edition, 2015.
3. Gary McGraw, "Software Security: Building Security In", Addison-Wesley,1st Edition, 2006.

VII. WEB REFERENCES:

1. https://www.oracle.com/in/cloud/application-development
2. http://computingcareers.acm.org/?page_id=12 3. http://en.wikibooks.org/wiki/cloud application

VIII. E-TEXT BOOKS:

1. https://www.books.google.co.in/books?id=bVbj9nhvHd4C
2. https://www.books.google.co.in/books?id=GrZHPgAACAAJ&dq=1.+J.S.R.Jang,+C.T.Sun+and+E.Mizutani,+Neuro,+Fuzzy+and+Soft+Computing,+PHI,+2004,Pearson+Education.