Detailed Syllabus for **PhD in Computer Science Research cloud computing (level 8)**
Faculty of Computer Science
Ballsbridge University

Note: A PhD scholar has to undertake *any one of the following units* **on which the PhD work is to be undertaken. This course work** *is a must***.**

Topics in Syllabus	Recommended References
Unit I **Introduction to Cloud Computing:** • **Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds** • **Administering & Monitoring cloud services, benefits and limitations, Deploy application over cloud** • **Comparison among SAAS, PAAS, IAAS Cloud computing platforms** • **Infrastructure as a Service: Amazon EC2** • **Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing** **Unit II** **Basics of virtualization and implementation challenges.** • **System virtualization technologies-architectures and internals. KVM, Xen, VMware.** • **Memory virtualization-virtualization techniques, ballooning, deduplication and sharing.** • **Network and storage virtualization** • **Virtual machine migration and replication techniques-pre-copy and post-copy techniques, applicability to system availability.** **Unit III** • **NoSQL databases** • **Cloud file systems: GFS and HDFS, BigTable, HBase and Dynamo.Map-Reduce and extensions** • **Enterprise batch processing using Map-Reduce, Introduction to cloud development, Example/Application of MapReduce** • **Features and comparisons among GFS, HDFS etc.** **Unit IV** **Cloud security fundamentals, Vulnerability assessment tool for cloud** • **Privacy and Security in cloud** • **Trusted Cloud computing, Secure Execution Environments and Communications** • **Identity Management and Access control, Biometric security for cloud** • **Cloud security challenges: Virtualization security management- virtual threats, VM Security Recommendations & VM-Specific Security techniques** • **Secure Execution Environments and Communications in cloud.**	• **Recent IEEE, Elsevier, ACM and other reputed Journal/ Book Chapters publications** • **Publication of at least 1 survey paper is an essential component of the course** • **2 International Conference publication and 2 publications in reputed International Journal are a must before writing the PhD thesis** • **All the manuscripts will be checked thoroughly for plagiarism.**