

<b>Module Title:</b>	Advanced Server Technologies
<b>Module Code:</b>	03H
<b>Level:</b>	6
<b>Credits:</b>	15
<b>Pre-Requisites:</b>	None

**Module Description:**

This module considers two contrasting models: the ISP model, consisting of many sites on one server; and the large or busy site model, where many servers combine to power a single site.

The clustering of servers leads to demand for load-balancing, which can be achieved through geographical load balancing or through network load balancing. Having achieved a load-balanced cluster, students learn the practical skills for monitoring the performance of the cluster.

This module introduces students to a challenging range and variety of complex technical or professional work activities, teaching strategies for providing a highly available infrastructure with the capacity for disaster recovery and failover.

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**Indicative Content:**

- Scalability: techniques for scaling solutions beyond the capacity of a single machine
  - Security for virtualisation
  - Load balancing: strategies for spreading load between servers
  - High-availability: fail-over and replication. Techniques for backing up live systems
  - Review of available load balancing components
  - Cloud technologies
  - Business context for server scalability and high-availability.
  - Virtual private server
  - Server clustering
  - Disaster recovery
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**Learning and Teaching Methods:**

The course will be taught with a variety of methods including lectures, workshops, tutorials and practical sessions. Generally the routine will consist of the posing of a problem and the development of solutions, including reviewing currently available solutions and, in some cases, modelling the solutions practically.

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## Module Specifications: Schools of Business & Management & Information Technology

### Specific Learning Resources:

Vmware or similar environment will be used to allow students to experiment with multiple-site/single server and multiple-server/single site configurations.

### Bibliography

#### Recommended

Al Muller (2009) *VMware Virtual Infrastructure Unleashed* Sams

#### Background Reading

N. Bajgoric (2009) *Advanced Server Technologies for Business Continuity* University of Sarajevo

Barratt, M., (2006). Skills Frameworks | Skills Framework for the Information Age | e- skills UK. Available at: <http://www.e-skills.com/Skills-Frameworks/1074> [Accessed May 6, 2008].

Zawodny, J. and Balling, D. (2008) *High Performance MySQL : Optimization, Backups, Replication, Load Balancing & More (Advanced Tools and Techniques for Mysql Administrators)* O'Reilly

## Module Learning Outcomes

### Subject Specific Learning Outcomes

On successful completion of this module you will be able to:

LO 1	Analyse, Design and implement a load-balanced multi-server system
LO 2	Test and benchmark a load-balanced multi-server system
LO 3	Review and critically evaluate the different approaches to providing scalable and highly-available system and the migration to cloud computing
LO 4	Justify the need for scalable server and highly-available servers

Assessment Title or element	Weighting (%)
Assignment: report documenting the design of a highly available and reliable server system with evaluation (2000 words) [late semester]	50%
Examination (1 hr 30 min) [end semester]	50%

*Information correct at point of publication.*