Module Code: **CMS 3407**
Module Title: **WEB AND NETWORK SERVICES**

Schools involved in delivery:	School of Computing and Engineering
Name of Course(s):	MSc Network Technology and Management MSc Advanced Computer Science MSc Information Systems Management
Module Leader:	Dr. David Wilson
Location for delivery:	Queensgate, Department of Informatics
Module Type:	Compulsory
Credit Rating:	15
Level:	M - Masters
Learning Methods:	Supervised Learning Lectures 6 hrs Seminar 6 hrs Tutorial 6 hrs Practical 6 hrs Directed Unsupervised Activity 114 hrs
Pre-requisites:	None
Recommended Prior Study:	None
Co-requisites:	None
Professional Body Requirements:	N/A
Barred Combinations:	None
Graded or Non Graded:	Graded

Module Synopsis

Computer networks are now in widespread use in both small and large organisations. In order to make informed choices, key decision-makers need a comprehensive knowledge of the technology, network architectures and protocols that underpin these networks. They also need to be able to assess the suitability of these different technologies and systems for meeting organisational requirements. This module will also examine technology, tools and techniques relevant to the use of contemporary web services. Effective web services are essential to many businesses with global uptake of e-business solutions and innovations. This leads on to consider the key principles of operation for integrated networks capable of supporting video, voice, data and graphics telecommunication services over local and wide area networks. Of particular interest will be the developing technologies and their impact on network architectures. A characterisation of the different types of traffic and the demands this places on network design will also be investigated.

Outline Syllabus

Review and debate the key issues surrounding:

- Web Services – to include:
  - Service-Oriented Architecture (SOA)
  - Web Service principles
  - Web Service technologies – e.g. SOAP, REST, WSDL, UDDI, XML

Also:

- Client and Server side development.
- Sockets and Remote Method Invocation (RMI).
- Multimedia and IP Telephony (VoIP).
- Communication optimisation for remote agents.
- Network architectures for remote interaction.
- Programming of remote operated devices.
- HTTP protocol and problems
- Secure servers
- Virtual machines
- Web proxies
- Load balancing

Learning Outcomes

1. Knowledge and Understanding Outcomes

Upon completion of this module the learner will have a critical awareness of:
1.1 The technology required for the provision of network based applications.
1.2 Methods for the development of distributed applications.
1.3 Advanced approaches for the provision of network services.

2. Ability Outcomes

Upon completion of this module the learner will be able to:
2.1 Identify and apply appropriate methods to support the development of an effective remote or web services application;
2.2 Model network systems and defend the appropriateness and consistency of the model.
2.3 Implement such models using network distributed techniques as appropriate.

Assessment Strategy

Formative assessment

Formative assessment will be via tutorial/practical exercises designed to guide the students' learning, and to prepare them for the summative assessment.

Summative Assessment

Assessment tasks (including assessment weightings)

Assignment One: A Network Operated System (50% of the overall assessment for the module)

This assignment will involve the design, and where appropriate, the development of a network based system. The students will be required to defend their chosen design and methods of invocation within a written summary of how the system was designed and implemented; the summary should not normally exceed 1500 words. This assignment will assess ability outcomes 2.1 to 2.3.

Assignment Two: A Report (50% of the overall assessment for the module).
Assignment two is the final assessment for this module.

This assignment comprises a report assessing Learning Outcomes 1.1 to 1.3. This report will assess the student's knowledge and understanding of the technologies studied to given organisational scenarios. For example, students may be asked to report on the benefits and implications of web proxies. The report should be in the region of 3200 words in length (approximately 8 pages, not including table of contents, figures, references and appendices).

Assessment Criteria

Assignment One – Network Operated System: Quality of construction/ design criteria/ presentation of solution.

Pass level achieved if solution is effective, key design criteria are met (with some weaknesses) plus a clear, structured presentation.

Modal level achieved if solution is complete and fully effective, all design criteria are met and justified plus a very clear, concise and well-argued presentation.

Assignment Two - Report: Quality of discussion, technical correctness, critical evaluation and quality of written work.

Pass level achieved if discussion covers main concepts, technical solutions are mostly met (with some weaknesses), critical evaluation covers primary issues plus a well-presented report.

Modal level achieved if discussion is comprehensive (covering primary and secondary issues), technical solutions are fully correct and considered, critical evaluation is perceptive/original plus an excellently structured and concisely written report.

Note:
Both assignments will be eligible for tutor reassessment.

Both assignments will be submitted for marking with an approved cover sheet containing the student's name, identity number and date of submission.

Learning Strategy
Students are expected to direct their own learning, making professional use of resources and others as necessary. Use will be made of guest speakers and practitioners where appropriate. During the module period, there is the networking workshop. This will be followed by a series of lectures and tutorials. Lectures will present the academic concepts and major networking technologies. In tutorials, students will be able to apply this knowledge to particular scenarios and engage in group discussion and debate.

Appendix: Indicative References

Web & Network Services CMS3407

Journals:

.Net
Journal of Network and Computer Applications
Network Computing
Computer Networks

Books (including e-books):

Aftab, A. (2005) *Wireless and mobile data networks,* John Wiley, Hoboken NJ

Comer. Douglas (2009) *Computer networks and internets*, Pearson Education, Upper Saddle NJ

DiMarzio, J.F. (2001) *Network architecture and design: a field guide for IT consultants,* Sams Publishing, Indianapolis

Ganguly & Bhatnagar, (2008) VoIP: Wireless, P2P and New Enterprise Voice over IP.

Lawler, James P., Howell-Barber, H. (2008) *Service-oriented architecture: SOA strategy, methodology and technology*, Taylor & Francis, London

Lee, Byeong Gi; Park, Daeyoung; Seo, Hanbyul (2009) *Wireless communications resource management*, John Wiley, Oxford

Oellermann, W.L (2001) *Architecting web services,* Apress, Berkeley CA

Peterson, L.L. & Davie, R. (2007) *Computer Networks: A Systems Approach*, Morgan Kaufmann.

Tanenbaum, A.S. (2003) *Computer Networks*, Prentice-Hall