SUBJECT DESCRIPTION FORM

Subject title: High Speed Networks

Subject code: EIE536

Credit value:

3

Responsible staff and department:

Dr M. Z. Wang, EIE

Pre-requisite:

Nil

Recommended background knowledge:

Knowledge of communication engineering at a level equivalent to an honours degree in electronic engineering.

Mutual exclusions: Nil

Learning approach:

Lecture/Seminars 36 hours
Laboratory 6 hours

Assessment:

Continuous Assessment 75%
Examination 25%
Total: 100%

Objectives:

To provide an overview of the state-of-the-art and scenarios of applications of high speed communication networks so that the students will have an appreciation and understanding of the various aspects and technologies of high speed and broadband networks, including unresolved problems.
Keyword syllabus:

1. Introduction
   1.1 The need for high speed network technologies and quality of service (QoS);
   1.2 Review on TCP/IP and ATM network basics;
   1.3 Queuing analysis and network simulation tools.

2. Broadband Traffic Characteristics
   2.1 Traffic characterization and models, traffic descriptors: cell delay variations, etc;
   2.2 Long range dependence;
   2.3 Self-similar traffic.

3 Congestion and Traffic Management
   3.1 Congestion control in data networks and internets;
   3.2 Link level flow and error control;
   3.3 TCP traffic control;
   3.4 Quality of Service in IP Networks

4 Dynamic routing in broadband networks
   4.1 Virtual path connection routing;
   4.2 Multiprotocol label switching routing;
   4.3 Constraint-based routing.

Indicative reading list and references:

   Articles in IEEE Journal on Selected Areas in Communications.

Laboratory and hands-on exercises:

1. Tools and measurement: quality of service in IP networks
2. Multiprotocol label switching networking

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