Networked Systems (COMP0023)

Description

Aims:
To offer a rigorous introduction to the problems that arise when networking computer systems, and algorithms and systems design that solve these problems. The architectural principles and protocols that underlie the internet will be explained in detail. Topics to be taught will include the physical layer, widely used link layers (wired and wireless), MAC protocols, internetworking, intra-domain routing, reliable transport, congestion control, wide-area (policy) routing, naming, network security, the end-to-end principle, and network applications.

Learning outcomes:
On successful completion of the module, students will understand the nuances of interactions between a network's distributed entities. This is a vital skill, without which one cannot truly be said to understand networking. To help students develop this skill, COMP0023 incorporates significant programming courseworks in Python and Java, in which students build or interact with working implementations of network protocols.

Content:
- Introduction to Networking; Information, Error Control Coding, and Compression;
- Medium Access Control: CDMA, ALOHA, and Ethernet; Link Layer Addressing and Forwarding; Spanning Trees;
- Achieving Reliability; Stop-and-Wait, Go-Back-N;
- Achieving Reliability (cont); Selective Repeat; Intro to Internetworking; Network Address Translation; Inside Internet Routers;
- The Domain Name System; Multi-hop Networks and end-to-end Arguments;
- Reliable Transport and TCP;
- TCP and Congestion Control;
- Intra-Domain Routing; Introduction, Distance-Vector, Link-State;
- Inter-Domain Routing; BGP;
- Wireless Networks; 802.11 MAC;

Key information

Year 2019/20
Credit value 15 (150 study hours)
Delivery UG L6, Campus-based
Reading List View on UCL website
Tutor Dr Stefano Vissicchio
Term Term 1
Timetable View on UCL website

Assessment

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk

Find out more
Security: Firewalls, Worms and IDSes; Content Delivery HTTP, Web Caching, and Content Distribution Networks.

Requisites:
In order to be eligible to select this module, a student must be registered on a programme for which it is a formally-approved option or elective choice AND must have EITHER (i) passed BSc/MEng Computer Science (Years 1 and 2) at UCL; OR (ii) passed MEng Mathematical Computation (Years 1 and 2) at UCL.
Networked Systems (COMP0023)

Description

Aims:
To offer a rigorous introduction to the problems that arise when networking computer systems, and algorithms and systems design that solve these problems. The architectural principles and protocols that underlie the internet will be explained in detail. Topics to be taught will include the physical layer, widely used link layers (wired and wireless), MAC protocols, internetworking, intra-domain routing, reliable transport, congestion control, wide-area (policy) routing, naming, network security, the end-to-end principle, and network applications.

Learning outcomes:
On successful completion of the module, students will understand the nuances of interactions between a network's distributed entities. This is a vital skill, without which one cannot truly be said to understand networking. To help students develop this skill, COMP0023 incorporates significant programming courseworks in Python and Java, in which students build or interact with working implementations of network protocols.

Content:
- Introduction to Networking; Information, Error Control Coding, and Compression;
- Medium Access Control: CDMA, ALOHA, and Ethernet;
- Link Layer Addressing and Forwarding; Spanning Trees;
- Achieving Reliability; Stop-and-Wait, Go-Back-N;
- Achieving Reliability (cont); Selective Repeat; Intro to Internetworking; Network Address Translation; Inside Internet Routers;
- The Domain Name System; Multi-hop Networks and end-to-end Arguments;
- Reliable Transport and TCP;
- TCP and Congestion Control;
- Intra-Domain Routing; Introduction, Distance-Vector, Link-State;
- Inter-Domain Routing; BGP;
- Wireless Networks; 802.11 MAC;

Key information

Year 2019/20
Credit value 15 (150 study hours)
Delivery PGT L7, Campus-based
Reading List View on UCL website
Tutor Dr Stefano Vissicchio
Term Term 1
Timetable View on UCL website

Assessment

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk

Disclaimer: All information correct as of June 2019. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.
Security: Firewalls, Worms and IDSes; Content Delivery HTTP, Web Caching, and Content Distribution Networks.

Requisites:
In order to be eligible to select this module, a student must be registered on a programme for which it is a formally-approved option or elective choice AND must have EITHER (i) passed BSc/MEng Computer Science (Years 1 and 2) at UCL; OR (ii) passed MEng Mathematical Computation (Years 1 and 2) at UCL.