

COE865 – Advanced Computer Networks

- **Course Outline:** <http://www.ee.ryerson.ca/undergraduate/dcd/coe865.html>

- **Key Knowledge to Be Acquired**

This is an advanced level undergraduate course in computer networking. The course is designed to include materials relevant to the industry, which is moving to deploy IP network in the backbone and offer QoS sensitive services, e.g. VOIP. The course deals with the principles, architectures, algorithms, and protocols related to Internet with emphasis on routing, transport protocol design, flow control and congestion control, IP Quality of Service and Traffic Engineering. Key topics include:- Routing (Distance-Vector (RIP), Link-State (OSPF), Inter-domain (BGP), Multicast Routing (IGMP, PIM-DM and PIM-SM)), Transport (TCP, Flow Control, Congestion Control), Quality of Service (QoS Building Blocks, Fair Queuing, AQM, IP QoS Models (IntServ, DiffServ)), Traffic Engineering (Virtual-Path Routing (MPLS), Constrained-based Routing).

- **Key Skills to Be Mastered**

The course provides in-depth understanding of algorithms and protocols, enables the student to make informed design choices and tradeoffs in designing techniques of solving networking problems such as routing, congestion control etc. Labs on DHCP, DNS, RIP and OSPF provide hands-on experience with IP network, and Project introduces protocol/algorithm simulation.

- **Potential Careers**

Career as network engineer in small to large scale businesses, service providers and communication equipment manufacturing industry, networking hardware and software engineer in developing routing, switching and other communication gears and software.

- **Potential Employers**

Service Providers (e.g. Bell, Rogers, Telus, Wind Mobile etc.), Communication Companies (e.g. Cisco, Juniper, many small communication companies), Businesses (e.g. Banks, Insurance Companies, Law firms, industries and other commercial businesses with sizable networks).

- **Graduate Studies**

This course builds the foundation for students to pursue advanced learning in Graduate Studies in Electrical and Computer Engineering or specialized Masters program in Computer Network.