

Academic Org: Dept of Computer Sci & Engg – Subject: Computer Science

Course: CSCI4430 **Course ID:** 002615 **Eff Date:** 2022-07-01 **Crse Status:** Active **Apprv. Status:** Approved **【Course Rev】**
Data Communication and Computer Networks 數據通信及計算機網絡

This course aims to introduce fundamental concepts and technologies in computer networking. The course adopts a top-down approach introducing the TCP/IP networking stack. The design of the contemporary communication applications will be studied. The fundamental concepts in implementing the reliable transport protocols, such as TCP, will be taught in this course. Design issues of TCP, such as the sliding window protocol and the congestion control, will also be included. This course will also focus on the IP network and the routing algorithms used in the Internet. Last, the design issues in the data link layer (e.g., Ethernet), including the medium access control, will be introduced.

本科旨在介紹有關電腦網絡的基礎概念與技術。本科採用由上而下的手法來介紹TCP/IP 協議。本科介紹現代的通訊應用的設計。然後，介紹以實踐可靠的通訊協議的基本概念，如TCP 的實踐。同時，本科亦包括了TCP 的設計課題，如滑窗協議及壅塞控制。本科同時亦集中討論IP網路與互聯網中使用的路由演算法。最後，本科介紹數據鏈路層（如乙太網）的課題，包括媒體存取控制。

Grade Descriptor: A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

Equivalent Offering:

Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)

Grading Basis: Graded

Repeat for Credit: N

Multiple Enroll: N

Course Attributes:

Topics:

COURSE OUTCOMES

Learning Outcomes:

1. Able to use TCP/UDP to create network applications.
2. Know how to provide reliable data delivery over communication channels (e.g., knowledge of stop-and-wait, sliding windows,..etc).
3. Understand the congestion issues and the end-host adaptation principles.
4. Understand the medium access and multi-access resolution protocols in local area networks and wireless networks.

Course Syllabus:

This course is designed to present a systematic approach to the study of data communication and computer networks. The ISO OSI seven layered protocols are accepted as the framework for the course. Physical layer includes digital data transmission, data encoding and data communication techniques. Medium access sublayer includes ALOHA control protocols, IEEE 802 local area network protocols and fiber optic network protocols. Data link layer design issues, error detection and correction, sliding window protocols, network layer design issues, routing algorithms and internetworking. Transport layer and session layer design issues and examples on application layer protocols.

Assessment Type: Essay test or exam : 50%
Others : 50%

Feedback for Evaluation:

1. Course questionnaire
2. Results of programming projects should be part of the indicators as to whether the students understand the materials.
3. Results of the examinations.

Required Readings:

-

Recommended Readings:

1. Computer Networking: A Top Down approach featuring the Internet
2. Computer Networks: A System Approach by L.L. Peterson and B.S. Davie
3. Unix Network Programming Vol I & II
4. Internetworking with TCP/IP: Vol I,II,III by D. E. Comer, D.L. Stevens
5. Data Networks by D. Bertsekas, R. Gallager

OFFERINGS

1. CSCI4430 Acad Organization=CSD; Acad Career=UG

COMPONENTS

LEC : Size=30; Final Exam=Y; Contact=3
TUT : Size=30; Final Exam=N; Contact=1

ENROLMENT REQUIREMENTS

1. CSCI4430 **Enrollment Requirement Group:**
1. Prerequisite: CENG3150 or CSCI3150 or ESTR3102.
2. Not for students who have taken ESTR3310 or ESTR4120 or IERG3310.

New Enrollment Requirement(s):

Pre-requisite = no change
Exclusion = no change

CAF

eLearning hrs for blended cls 0
No. of micro-modules 0
Research components (UG) 50%-74%

< E N D O F R E P O R T >