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Number: 99-22C
Submission Date: ~~99-23b~~ ~~98-42c~~
Action-Date: UWUCC App 12/14/99
Senate App 2/29/00

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. CONTACT

Contact Person William Oblitey Phone 7-2524

Department Computer Science

II. PROPOSAL TYPE (Check All Appropriate Lines)

X COURSE LAN Design & Instal
Suggested 20 character title

X New Course* CO/IM 352 LAN Design and Installation
Course Number and Full Title

____ Course Revision _____
Course Number and Full Title

____ Liberal Studies Approval+ for new or existing course _____
Course Number and Full Title

____ Course Deletion _____
Course Number and Full Title

____ Number and/or Title Change _____
Old Number and/or Full Old Title

_____
New Number and/or Full New Title

____ Course or Catalog Description Change _____
Course Number and Full Title

_____ PROGRAM: ____ Major ____ Minor ____ Track

____ New Program* _____
Program Name

____ Program Revision* _____
Program Name

____ Program Deletion* _____
Program Name

____ Title Change _____
Old Program Name

_____
New Program Name

III. Approvals (signatures and date)

Department Curriculum Committee

Department Chair

College Curriculum Committee

College Dean

+Director of Liberal Studies (where applicable)

*Provost (where applicable)

CO 352 & IM 352 - Local Area Networks Design and Installation

I. Catalog Description

CO 352 LAN Design and Installation 3c-01-3sh

Prerequisites: IM 350 or OS 313 or any CO course numbered 300 or higher

A study of fundamental local area networking concepts. Detailed study of the basics of local area network (LAN) technology. Comparative study of commercially available LAN systems and products. The course will feature a hands-on laboratory implementation of a LAN.

II. Course Objectives

Upon successful completion of this course, the student will be able to:

A. Understand the components of LANs and the purpose of each.

B. Interconnect computing machines to constitute a LAN.

C. Install and configure a LAN operating system

D. Examine and analyze packets on a LAN transmission medium.

E. Implement LAN auditing functions to enhance the security and integrity of LAN transactions.

III. Detailed Course Outline

1. The Basics of LANs. (3 hours)
An overview of the history of the evolution of LANs. An explanation of the components and associated terminology of LANs. Advantages of LANs and problems faced by LAN users.

2. LAN Standards (3 hours)
A look at the LAN standards that specific vendors follow and the resulting medium access control standards set by the Institute of Electrical and electronic Engineers (IEEE) 802 Standards Committee.

3. LAN Transmission Media (3 hours)

A discussion of the properties and characteristics of the cables that interconnect the nodes in a LAN.

4. LAN Topologies and Protocols (6 hours)
An explicative discussion of the spatial arrangements of the machines that comprise LANs. A look at the rules used in data exchange between the nodes in a LAN and a mapping of the various medium access control protocols with the topologies.

5. Basic Component Architecture (3 hours)
A detailed exploration of the technology and trends of the important constituents of LAN architectures, namely clients and servers. A study of the vital relationship and interdependencies between hardware technology of the constituents parts of a local area network.

6. LAN Operating Systems (3 hours)
A look at various network operating systems in terms of their multiuser and multitasking architectures. An examination of the features that distinguish network operating systems from conventional operating systems. An exploration of the functions of server and client software. An explanation of the services provided by network operating systems. Distinguishing between server operating systems and server network operating systems.

7. Commercially Available LANs (3 hours)
A look at the features of the most prominent commercially available LANs. A comparison and contrast of the products.

8. Fundamentals of LAN Design (3 hours)
Comparison and contrast of File server functions and Client server functions. Dedicated versus non-dedicated servers. Security issues and disaster recovery details.

9. LAN Installation (6 hours)
An overview of topology implementation and installation of the network operating system. Examination of the demands on a LAN manager. A look at network operating system menus, establishment of login scripts. A hands-on installation of NetWare or other current operating system.

10. Application Software (3 hours)
A look at the selection and installation of application software on LANs. Concerns with licensing, file server memory management, etc.

11. LAN Management and Control (3 hours)
An exploration of the methodologies for gathering LAN traffic statistics; survey of protocol analyzers; security control and encryption/decryption techniques.

12. In-class Examinations (3 hours)

IV. Evaluation Methods

20% Homework assignments and Research paper. These will be based on material discussed in class and on aspects of the project.

40% Examinations. Two in-class exams and a final exam all of which count equally toward the 40%. Examinations consist of short-answer, analysis, and what-if questions.

40% Project. The project is to install network interface cards into the computers, attach the computers with a cable, and then install and configure a network operating system. The student will have to demonstrate that the completed project (the LAN) is functional.

Grading Scale: The standard grading scale will be used.
90%+=A; 80-89%=B; 70-79%=C; 60-69%=D; below 60%=F.

V. Required Textbook(s), Supplementary Books and Readings

Goldman, James E., *Local Area Networking: A Client/Server Approach, John Wiley & Sons, Inc.*, New York, NY 1997.

Several handouts will be given to provide students with guidance with the projects. The professor has other related material that will be placed on reserve for students' use during the progress of the course.

VI. Special Resource Requirements

The Eberly networking laboratory is adequately equipped for this course.

VII. Bibliography

Baca, H.R., Zagar, C.M., and Zinky, M.A., *Local Area Networks with Novell*, Wadsworth Publishing Company, Belmont, CA 1995.

Black, U., *OSI: A Model for Computer Communications Standards*, Prentice-Hall, Inc., Englewood Cliffs, NJ 1991.

Black, U., *Computer Networks: Protocols, Standards and Interfaces*, (Second Edition), Prentice-Hall, Inc., Englewood Cliffs, NJ 1993.

Cohen, A.M., *A Guide to Networking*, (Second Edition), Boyd & Fraser Publishing Company, Danvers, MA 1995.

Derfler, F.J., Jr., *PC Magazine Guide to Connectivity*, Ziff-Davis Press, Emeryville, CA 1991.

Fitzgerald, J., *Business Data Communications: Basic concepts, Security, and Design*, (Fourth Edition), John Wiley and Sons, Inc., New York, NY 1993.

Harbaugh, L.G., *Novell's Problem-Solving Guide for NetWare Systems*, SYBEX, Inc. Alameda, CA 1993.

Held, G., *Data Communications Networking Devices*, (Second Edition), John Wiley and Sons, New York, NY 1989.

Lawrence, B., *Using Novell NetWare*, (Second Edition), Que Corporation, Indianapolis, IN 1992.

Madden, J., and Stuple, S. J., (Editors), *Networking Essentials*, (Second Edition), Microsoft Press, Redmond, WA 1998.

Moshos, G.J., *Data Communications: Principles and Problems*, West Publishing Co., St. Paul, MN 1989.

Ramos, E., Schroeder, A., and Simpson, L., *Data Communications and Networking Fundamentals Using Novell NetWare*, Macmillan Publishing Company, New York, NY 1994.

Stallings, W., *Data and Computer Communications*, (Fourth Edition), Macmillan Publishing Company, New York, NY 1994.

Stallings, W., *Local and Metropolitan Area Networks*, (Fourth Edition), Macmillan Publishing Company, New York, NY 1994.

Steenstrup, M., *Routing in Communications Networks*, Prentice-Hall, Inc., Englewood Cliffs, NJ 1995.

Tanenbaum, A.S., *Computer Networks*, (Second Edition), Prentice-Hall, Inc., Englewood Cliffs, NJ 1989.

Walrand, J., *Communication Networks:A First Course,* (Second Edition), WCB/McGraw-Hill Inc. Boston, MA 1998.

White, C.M., *Data Communications and Computer Networks: An OSI Framework*, Boyd & Fraser Publishing Company, Danvers, MA 1995.

Course Analysis

Section A: Details of the Course

A1 LANs have grown to become quite popular and many of our majors have obtained jobs as LAN managers. Some of our experiential study students also go to companies to function as LAN managers. The departments, at the moment, do not have courses which explicitly teach the ideas of LANs as proposed in this course. Both departments Corporate Advisory Boards have suggested the need for extensive exposure of LANs to the students. This course will fit into the programs of the departments by meeting this need. The course is designed with computer science, MIS, and technology support (office systems) majors in mind, but any student with the necessary background will be accepted.

A2 The course does not require changes in the contents of any of our existing courses. It will serve as a requirement for both MIS and Technology Support majors.

A3. The Computer Science and MIS departments have offered this as a special topics course.

A4 The course is not intended to be listed as dual level.

A5 The course may not be taken for variable credit.

A6. Quite a number of universities and colleges offer this course in various forms and modifications. For example, the School of Library and Information Science of the University of Pittsburgh and Kent State University offer versions of this course.

A7 The Association for Computing Machinery (ACM), the Association for Information Systems (AIS) and the Association for Information Technology Professionals (AITP) all recommend this course.

Section B: Interdisciplinary Implications

B1 The course is designed to be taught by one instructor.

B2 This course is jointly proposed by the Computer Science and the MIS Departments and will be cross listed. The course does not overlap with any other courses at this University.

B3 Students from the School of Continuing Education, if they want to take this course and meet the prerequisites, will be welcome.

Section C: Implementation

C1 Faculty resources are currently adequate.

C2 Resources needed for this course are available although they can be improved.

a. Space: Classroom space is adequate. The Eberly networking laboratory is adequately equipped for this course.

b. Equipment: The Eberly networking laboratory is adequately equipped for this course.

c. Laboratory Supplies and other Consumable Goods: Both departments have licensed copies of network operating systems and some applications software for projects. However, periodic updates will be required to keep up with the technology.

d. Library Materials: There is an adequate source of reading material in Stapleton Library that can support this course.

e. Travel Funds: No travel funds are needed.

C3 No resource for this course is funded by a grant.

C4 The course is expected to be offered every semester. If demand increases, the frequency of offering will be increased accordingly.

C5. It is anticipated that one or two sections of the course will be offered each semester. Again, based on demand, this can be increased.

C6 Twenty-five students will be accommodated in a section of the course.

C7 No professional society recommends enrollment limits or parameters for this course or for courses resembling this course. However, past experience has shown that twenty-five students per section can be accommodated.

IUP

Indiana, Pennsylvania 157(

Date: December 16, 1998

Subject: Letter of Support for Computer Science Curriculum Proposals

To: Dr. William Oblitey, Chair, Computer Science Department
Mr. James Wolfe, Computer Science Department

From: Kenneth L. Shildt, Chair, MIS and Decision Sciences Department KLS
Elizabeth M. Pierce, MIS and Decision Sciences Department EMP

The MIS and Decision Sciences Department supports the course proposals for CO/IM 352 Local Area Networks Design and Installation as it is being proposed as a course for Computer Science, Office Systems, and MIS majors. This course, along with CO/IM 354 Local Area Networks Administration, will enable students majoring in the area of Information Technology to gain knowledge, which will undoubtedly enhance their professional career preparation.

The dual-listing of these courses demonstrates a spirit of cooperation in the planning and implementation of curriculum which should result in more efficient utilization of the University's resources as well as more flexibility in the scheduling of courses by the majors.

The ability to share the special purpose networking lab located in the Eberly College of Business has the full approval of the MIS Faculty and Dean Robert Camp. A scheduling model will be developed by the Departments to insure that each version of the proposed courses will be given equitable delivery.

The MIS and Decision Sciences Department also supports the course proposal for CO 304 Interactive Internet Programming in JAVA. This course will enable both MIS and Computer Science majors who have had the prerequisite CO110 to learn how to write applications for the Internet. Such skills are currently in high demand in the job market and the offering of this course will benefit both our students and the organizations that recruit our students.

In addition to the new courses listed above, the Computer Science Department listing of a revised set of courses which may be utilized as controlled electives by its majors is strongly supported by the MIS and Decision Sciences Department. The interaction of Computer Science and MIS majors in classes will provide for a continuing dialogue between the Departments and result in a stronger set of courses for both majors to schedule.

IUP

Indiana, Pennsylvania 15705

TO: William Oblitey, Chair
Computer Science Department

Jim Wolfe, Curriculum Committee Chair
Computer Science Department

FROM: Wayne Moore, Chair
Office Systems and Business Education Department

Cathleen Golden, Curriculum Committee Co-Chair
Office Systems and Business Education Department

DATE: December 15, 1998

SUBJECT: CO 304, CO/IM 352, and CO/IM 354 New Course Proposals

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The Office Systems and Business Education department faculty have reviewed the course proposals for CO 304, Interactive Internet Programming in JAVA, and CO/IM 352, LAN Design and Installation. CO/IM 354, Advanced Topics in Local Area Networks, is still under review. The following is a statement of our position.

The Office Systems and Business Education department supports CO 304 and CO/IM 352. We feel they are excellent courses and provide necessary coverage in the technology field. We would like our students to be able to take both courses. CO 304 is problematic in that regard since it has a prerequisite of CO 110 which our students are not likely to have taken. We ask, therefore, that the prerequisite be stated as CO 110 or equivalent to allow our students to enroll in the course.

The spirit of cooperation among the departments that led to the development of these courses strengthens our departments' programs. If you would like to discuss this further, please contact us.

c: Robert Camp, Dean, Eberly College of Business
Ken Shildt, Chair, MIS and Decision Sciences