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CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. **CONTACT**

Contact Person Dr. Richard A. Halapin Phone 357-5777

Department MIS and Decision Sciences

II. **PROPOSAL TYPE (Check All Appropriate Lines)**

__X__ **COURSE** Network Design
Suggested 20 character title

__X__ New Course* IM 354 Network Design and Advanced Administration
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)

Louise B. Burky
Department Curriculum Committee

Kenneth L. Stulat
Department Chair

College Curriculum Committee

K. Comp
College Dean

+Director of Liberal Studies (where applicable)

*Provost (where applicable)

SYLLABUS OF RECORD

I. Catalog Description

IM 354, Network Design and Advanced Administration — 3 credits, 3 lecture hours, 3 lab hours (3c-3l-3sh)

Prerequisites: IM 352, Jr. Standing

This course expands on topics that are related to server and client management and performance. Students will work with concepts such as, server startup procedures and configurations, network server components, memory concepts, parameters, console commands, and remote server management. Attention will be paid to network performance management and optimization, performance issues, performance monitoring, and optimization performance. Also included will be server protocol support, protocol types, transport protocol support, and frame types support.

This course also provides fundamental information concerning the challenges of designing and implementing an inter-network infrastructure and its management strategy. The approach requires an unbiased look at inter-networking technologies and describes design and implementation for Local Area Network (LAN) protocols, intermediate devices (repeaters, bridges, routers and gateways), and Metropolitan Area Network (MAN) and Wide Area Network (WAN) links. Inter-network management protocols and design are also discussed.

IM 352, Network Installation and Administration, is a prerequisite.

II. Course Objectives

This course provides MIS students with information that enhances their network managing and monitoring skills, and includes topics that are related to server and client management and performance. Participants work with these concepts through lectures, demonstrations, discussions, and many hands-on activities.

The class includes topics that are related to server and client management and performance. Students will work with these concepts through lecture and demonstrations. An emphasis is placed on hands-on activities. This course is designed for experienced MIS students, NetWare v3.12 administrators and CNE or ECNE candidates. This course is not necessary for CNA candidates, but is an advantage when combined with the IM352, Network Installation and Administration course. This approach will give the student a thorough overview of NetWare from an operating system perspective which includes:

1. Server startup procedures and configuration files, NetWare server components, SET parameters, console commands, remote server management review, and creating NCF files.

2. Server protocol support, protocol types, transport protocol support, frame types support, name space support. p9p5

3. Server memory concepts and management, server memory pools, server memory console commands.

4. Network performance management and optimization, performance issues, performance monitoring, and optimization performance.

5. Server management and maintenance, bindery repair, volume repair, and removal of name space support; server and client backup, server maintenance utilities.

III. Course Outline

A. Server Startup Procedures and Configuration Files (10 percent)

1. Server Components and Startup Procedures
2. Server Configuration Parameters and Files
3. Console Commands
4. Remote Server Management

B. Server Protocol Support (10 percent)

1. Protocol Types
2. Transport Protocol Support
3. Frame Types Support

C. Server Memory Concepts and Management (5 percent)

1. Server Memory Concepts and Requirements
2. Console Memory Commands

D. Network Performance Management and Optimization (10 percent)

1. Performance Issues
2. Monitoring and Optimizing Network Performance

E. Server Management and Maintenance (5 percent)

1. Server Volume Repair and Backup
2. Server Maintenance Utilities

F. Advanced Print Services Management (5 percent)

1. Advanced Print Services Setup
2. Settings for Print Queues and Operators

G. DOS Client Management (10 percent)

1. DOS Requester Concepts and Configuration
2. Client Virus Protection
3. Configuring Diskless Workstations

H. OSI Review (5 percent)

1. OSI model review
2. Models vs. protocols vs. implementations p9p5

I. Inter network Design Considerations (5 percent)

1. Reasons for inter networking
2. Creating a needs analysis (review)

J. LAN Design Considerations (5 percent)

1. Media frame types and selection criteria
2. Network operating system selection criteria
3. Establishing multi-protocol environments

K. Repeaters and Bridges (5 percent)

1. Repeaters
2. Transport and source routing bridges
3. Spanning tree protocol
4. Implementation and management issues

L. Routers and Gateways (5 percent)

1. Routers vs. bridges
2. Gateways

M. Inter network Management Design Considerations (10 percent)

1. Management protocols
2. Designing a management scheme

N. MAN/WAN Links (10 percent)

1. Switching methods
2. Voice grade circuits
3. Digital Data Services
4. T carriers
5. SMDS, SONET, ISDN
6. X.25
7. Frame relay and Cell relay (ATM)
8. Network Theory and Design

IV. Evaluation Methods

The final grade for the course will be determined as follows:

40% Tests. Two tests (mid-term and final) consisting of multiple choice and true-false questions. 100 points each.

50% Performance test. Each student will be expected to optimize servers on two networks of significant and prominent business use, e.g., Novell NetWare and Windows NT. They will also be expected to install routers, bridges, gateways, and supporting protocols for internetwork linking.

10% Research Paper. Each student will prepare a 4-8 page paper and presentation describing the internetwork requirements for linking the above installed networks to two other networks of p9p5 significant and prominent business use, e.g., Banyan Vines and Unix.

V. Required textbooks, supplemental books and readings

Textbook: Rains, Alvin L. and Michael J. Palmer, Local Area Networking with Novell Software, Boyd & Fraser Publishing Co., Danvers, MA, 1994

Textbook: Smoot Carl-Mitchell and John S. Quarterman, Practical Internetworking with TCP/IP and Unix, Addison-Wesley Publishing Co., Reading, MA, 1993

Textbook: Spragins, John D., Telecommunications: Protocols and Design, Addison-Wesley Publishing Co., Reading, MA, 1991

VI. Special resource requirements

Hardware. Hardware support for IM 354, Network Design and Advanced Administration will be provided through a dedicated microcomputer laboratory. Equipment requirements are intended to provide hands-on training in advanced aspects of managing computer networks. Training will include network performance optimization, multiple protocol support, and inter-networking implementation.

Software. Software support will include a complete suite of operating system, network management, and application software designed for network use. MIS majors must be able to support network users and optimize network performance in complex network environments. Their training should include advanced aspects of networking and inter-networking. In depth capabilities in network design, construction, and management will be an over-riding goal.

VII. Bibliography

Black, Uyless D., Data Communications and Distributed Networks, Prentice-Hall, Englewood Cliffs, NJ, 1987

Black, Uyless D., Data Networks, Prentice-Hall, Englewood Cliffs, NJ, 1989

Cohen, Alan M., A Guide to Networking, Boyd & Fraser Publishing Co., Danvers, MA, Ed. 2, 1995

Comer, Douglas E., Internetworking with TCP/IP, Prentice-Hall, Englewood Cliffs, NJ, 1988

Ellis, Robert L., Designing Data Networks, Prentice-Hall, Englewood Cliffs, NJ, 1986

Martin, James, Telecommunications and the Computer, Prentice-Hall, Englewood Cliffs, NJ, 1990

Quarterman, John S. and Smoot Carl-Mitchell, The Internet p9p5 Connection, Addison-Wesley Publishing Co., Reading, MA, 1994

Rowe, Stanford H., Business Telecommunications, Science Research Associates, Chicago, 1988

Stallings, William, Business Data Communications, Macmillan Publishing Co, New York, NY, Ed. 3, 1990

Stallings, William, Data and Computer Communications, Macmillan Publishing Co, New York, NY, Ed. 3, 1988

Stallings, William, Local Networks, Macmillan Publishing Co, New York, NY, Ed. 3, 1990

Stamper, David A., Local Area Networks, The Benjamin/Cummings Publishing Co., Redwood City, CA, 1994

COURSE ANALYSIS QUESTIONNAIRE

A. Details of the Course

A1 This course will be an elective for students in the B.S. in the Management Information Systems program. It is not required by any major nor intended for inclusion in the Liberal Studies program.

A2 This course does not require changes in any other courses or programs in the department.

A3 This course has never been offered at IUP.

A4 This course is not intended to be dual level.

A5 This course is not to be taken for variable credit.

A6 This course responds to rapidly changing business needs for network knowledgeable MIS program graduates and is typically not offered in other Colleges of Business.

A7 This elective course is not required to meet any College of Business or other accreditation standards.

B. Interdisciplinary Implications

B1 This course will not be team taught.

B2 This course does not overlap with any other courses at the University.

B3 No special reservations will be implemented.

C. Implementation

C1 No new faculty are needed to teach this course. One section of this course can be accommodated in Fall semester teaching schedule every year. Any course load adjustments can be accomplished through rescheduling of IM 101, Computer Literacy teaching load.

C2 Other Resources

a. Current space allocations are adequate to offer this course.

b. The department will use the computer facilities of the College of Business for this course.

c. The department budget is sufficient to purchase supplies for this course.

d. Library holdings are adequate and mainframe resources will be neither utilized or nor required.

e. A small amount ($100) of travel funds may be needed to rent vans to transport students to observe modern corporation network installations.

C3 No grant funds are associated with this course.

C4 This course will be offered once every year in the Fall.

C5 One section of the course will be offered at a time.

C6 A maximum of twenty students will be accommodated in this course. The nature of the lab activities restricts enrollment to this number.

C7 Enrollments are not mandated or recommended by any society.

D. Miscellaneous

No additional information is necessary.