



# Minnesota State University, Mankato HOLD and CLEAR buttons only compatible with Acrobat V. 4 and 5 Curriculum Proposal

Please type or select the requested information. Print completed forms, add appropriate paper attachments, and route through MSU's curricular process for recommendations and decisions.

		(Check all that apply):	Proposal #	103
College:	Science, Engineering and Technology	<input checked="" type="checkbox"/> Undergraduate	Effective Date of Change:	
Department:	Computer and Information Sciences	<input type="checkbox"/> Graduate	Academic Year	06-07
Program:	Computer Information science	CIP # 11.0701 00	(For Office Use Only)	
Type of Change	COURSE PROPOSALS		Course Designator and Number	Number of Credits
Proposed:	Change in Designator and Number		COMS 362	4
Title Current:	Introduction to Data Communication and Networking		IT 360	4
Title Proposed:	Introduction to Data Communication and Networking			
24-Char. Abbrev:	Intr Data Comm & Network		(if applicable)	

Include a course or program description for the Bulletin (30-40 words maximum for courses, 100 for programs):

This course covers basic concepts related to data communication and networking. Topics addressed will include the OSI model, the Internet model, network management, network protocols and data security.  
Pre: IT 210 or ISYS 210 F, S

Rationale or Justification for change:

The CIS major is being redesigned and name changed to Information Technology (IT). The above change is proposed to be consistent with the IT major and it's designator and numbering scheme.

**\*\*\*For General Education or Cultural Diversity Courses Only\*\*\***

<p><b>General Education Course:</b></p> <p>GE Category #    GE Category Name (Maximum of 3 Categories)</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>? For Writing Intensive Courses, attach a description of the kind and quantity of writing. ? For Upper Division Courses, include a description of the respects in which it is broad and general rather than narrow and specific, and so suitable as GE.</p> <p>Attach paper copies of the following:</p> <p>a. Syllabus or course outline. b. Course's student learning outcomes associated with each GE competency or CD designation. c. List of strategies to be used to assess students' achievement of each GE competency or CD designation.</p>		<p><b>Cultural Diversity Course:</b></p> <p>(Please check one.)</p> <p><input type="checkbox"/> Core (At least 75% devoted to topics of race, gender, sexual orientation, age, class, and disabilities as they occur in United States Society.)</p> <p><input type="checkbox"/> Related (At least 25% devoted to the above topics or to a global perspective on topics related to African American, Asian, Hispanic, and Native American inhabitants of the United States.)</p>
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**\*\*\*For New Courses\*\*\***

(Check all that apply):	Instructional Type:	Lecture	Course will be offered:
<input type="checkbox"/> Course is an elective.	Grading Format:	<input checked="" type="checkbox"/> Grade <input type="checkbox"/> P/N	<input checked="" type="checkbox"/> Fall Semester
<input checked="" type="checkbox"/> Course is required for program	Information Technology (IT)		<input checked="" type="checkbox"/> Spring Semester
<input checked="" type="checkbox"/> Pre- or Co-requisites:	IT 210 or ISYS 210		<input type="checkbox"/> Summer Session
<input type="checkbox"/> Other courses are being changed or eliminated. (Explain.)			
<p><input type="checkbox"/> Course content or title is similar to courses in other departments. (Attach copy of letter of agreement with other program(s) contacted. Indicate the nature of the discussions and/or resolution of differences or potential conflicts.)</p> <p>Attach paper copies of the following:</p> <p>a. Syllabus or course outline. b. Course's student learning outcomes. c. A list of resources required to offer and support this course. d. A description of how teaching this course will affect department staffing. e. If 400/500 level course, an explanation of added expectations of graduate students.</p>			



Minnesota State University, Mankato  
Curriculum Proposal

\*\*\*Signature Page\*\*\*

**Department**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

David J. Augli 10/9/06  
 Department Chair Date

Comments:

**College Curriculum Committee**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

Karen C. Chou 11/2/06  
 Committee Chair Date

Comments:

**College Dean**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

[Signature] 11/2/06  
 Dean Date

Comments:

**General Education Subcommittee**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

\_\_\_\_\_  
 General Education Subcommittee Chair Date

Comments:

**Undergraduate Curriculum and Academic Policy Committee**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

[Signature] 1-31-07  
 UCAP Faculty Chair Date

Comments:

**Faculty Association Graduate Committee**

Recommended  
 Not Recommended

\_\_\_\_\_  
 Faculty Association Graduate Chair Date

Comments:

**Graduate Dean**

Recommended  
 Not Recommended

\_\_\_\_\_  
 Graduate Dean Date

Comments:

**Academic Affairs Council**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

David Flannery 2/9/07  
 Assistant Vice President Date

Comments:

**Senior Vice President and Vice President for Academic Affairs**

Approved (Category/ies \_\_\_\_\_)  
 Not Approved (Category/ies \_\_\_\_\_)

[Signature] 2/13/07  
 Sr. Vice President / Vice Pres. Academic Affairs Date

Comments:

# IT 360 (4) Introduction to Data Communication & Networking

## Textbook:

Data Communications and Networking, by Behrouz A. Forouzan, McGraw Hill

## Prerequisites

IT 210 or ISYS 210

## Course Objectives

The intent of this course is to introduce the students to the field of data communications. This course encompasses telecommunication, local area networks, wide area networks, and wireless communication. Topics include TCP/IP and OSI reference models, media communication basics (copper, fiber, wireless), MAC protocols, transmission protocols, error detection and correction, TCP/IP protocols and socket programming, networking hardware, basic network designs and network security.

## Catalog Description

This course covers basic concepts related to data communication and networking. Topics addressed will include the OSI model, the Internet model, network management, network protocols and data security.

## Learning Outcomes

### 1) Introductory concepts

*Basic introductory concepts and terminology are introduced. The student will:*

- a) know about TCP & OSI reference models and the networking terminology
- b) know about the various network topologies and their impact on cost, performance and security

### 2) Socket programming

*The student will be able to implement socket-based programs that behave as clients or servers.*

- a) Have general knowledge of TCP and UDP sockets and their programming APIs
- b) Implement an application-layer protocol simulator or protocol communicator

### 3) Physical layer and data transmission concepts

*For a given data transmission scenario, the student will be able to:*

- a) identify physical layer characteristics given some data and security constraints

- b) understand the advantages and disadvantages of analog and digital communications
- c) understand FDM, TDM and WDM multiplexing
- d) compute transmission speeds and quality requirements (amount of error detection power required for a given medium and quality level)

#### 4) Data link layer concepts

*The student will understand the complexity and limitations of each responsibility of the data link layer. The student should be able to:*

- a) perform framing based on characters (BSC) and bits (HDLC)
- b) perform error detection using LRC, VRC, and CRC
- c) perform error correction using hamming code
- d) understand and simulate medium access control protocols (CSMA /CD /CA)
- e) perform flow control using stop-and-wait, go-back-n, and sliding window protocols
- f) program an error detection/correction software application

#### 5) Network layer concepts

*The student should be able to:*

- a) understand routing concepts of host-to-host delivery, internetworking, addressing, ARP, ICMP, IPv4 and IPv6
- b) understand and simulate routing protocols (DVR and LSR)
- c) understand the network-layer needs for security and the available options and costs

#### 6) Transport layer concepts

*The student should be able to:*

- a) understand process-to-process delivery using UDP and TCP, congestion control techniques and quality of service requirements
- b) program a socket-based software application using UDP and TCP

#### 7) Application layer concepts

*The student should be able to:*

- a) understand HTTP, DNS, SMTP, FTP, multimedia streaming, VoIP, digital signatures, internet security protocols, PGP, VPNs, firewalls
- b) understand the symmetric-key cryptography and public-key cryptography
- c) perform encryption and decryption using symmetric keys (traditional ciphers)
- d) program a software application implementing an encryption/decryption algorithm