Minnesota State University, Mankato

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.

<table>
<thead>
<tr>
<th>College:</th>
<th>Science, Engineering and Technology</th>
<th>Undergraduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department:</td>
<td>Computer and Information Sciences</td>
<td>Graduate</td>
</tr>
<tr>
<td>Program:</td>
<td>Computer Information Science</td>
<td>CIP # 11.0701 00</td>
</tr>
<tr>
<td>Type of Change:</td>
<td>COURSE PROPOSALS</td>
<td></td>
</tr>
<tr>
<td>Proposed:</td>
<td>New Course</td>
<td></td>
</tr>
<tr>
<td>Title:</td>
<td>Network Administration and Programming</td>
<td></td>
</tr>
<tr>
<td>24-Char. Abbrev:</td>
<td>Network Admin and Prog</td>
<td></td>
</tr>
</tbody>
</table>

Include a course or program description for the Bulletin (30-40 words maximum for courses, 100 for programs):
Network and server systems administration. Domain administration; file system management; networked printers; user management; workstation configuration. Network programming assignments/projects in Layered Software Systems, HTTP Server, UDP (TFTP or DNS), CGI program, IPV6, RPC/SCTP.
Pre: IT 350 or ISYS 350, IT 460
Variable

Rationale or Justification for change:
The CIS major is being redesigned and name changed to Information Technology (IT). This course is included in the required elective sequence for Networking and Information Security.

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

<table>
<thead>
<tr>
<th>GE Category #</th>
<th>GE Category Name (Maximum of 3 Categories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

? 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.

Attach paper copies of the following:

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.

***For New Courses***

<table>
<thead>
<tr>
<th>Instructional Type:</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course:</td>
<td>Information Technology (IT)</td>
</tr>
<tr>
<td>Grading Format:</td>
<td>X Grade</td>
</tr>
<tr>
<td>P/N</td>
<td></td>
</tr>
<tr>
<td>Pre- or Co-requisites:</td>
<td>IT 350 or ISYS 350, IT 460</td>
</tr>
<tr>
<td>Other courses are being changed or eliminated. (Explain.)</td>
<td></td>
</tr>
<tr>
<td>Course will be offered:</td>
<td>X Fall Semester</td>
</tr>
<tr>
<td>X Spring Semester</td>
<td></td>
</tr>
<tr>
<td>□ Summer Session</td>
<td></td>
</tr>
</tbody>
</table>

□ 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.)

Attach paper copies of the following:

a. Syllabus or course outline.
b. Course's student learning outcomes.
c. A list of resources required to offer and support this course.
da. 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.

Revised September 2002
### Signature Page

**Department**
- **Recommended** (Category/ies: ___________)
- **Not Recommended** (Category/ies: ___________)
- **Comments:**

Department Chair: [Signature] 10/9/06

**College Curriculum Committee**
- **Recommended** (Category/ies: ___________)
- **Not Recommended** (Category/ies: ___________)
- **Comments:**

Committee Chair: [Signature] 11/2/06

**College Dean**
- **Recommended** (Category/ies: ___________)
- **Not Recommended** (Category/ies: ___________)
- **Comments:**

Dean: [Signature] 11/6/06

**General Education Subcommittee**
- **Recommended** (Category/ies: ___________)
- **Not Recommended** (Category/ies: ___________)
- **Comments:**

General Education Subcommittee Chair: [Signature] Date

**Undergraduate Curriculum and Academic Policy Committee**
- **Recommended** (Category/ies: ___________)
- **Not Recommended** (Category/ies: ___________)
- **Comments:**

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

**Faculty Association Graduate Committee**
- **Recommended**
- **Not Recommended**
- **Comments:**

Faculty Association Graduate Chair: [Signature] Date

**Graduate Dean**
- **Recommended**
- **Not Recommended**
- **Comments:**

Graduate Dean: [Signature] Date

**Academic Affairs Council**
- **Recommended** (Category/ies: ___________)
- **Not Recommended** (Category/ies: ___________)
- **Comments:**

Assistant Vice President: [Signature] 2/6/07

**Senior Vice President and Vice President for Academic Affairs**
- **Approved** (Category/ies: ___________)
- **Not Approved** (Category/ies: ___________)
- **Comments:**

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

Revised September 2002
IT 462/562 (4) Network Administration and Programming

a. SYLLABUS

Textbook:


Recommended Text


Prerequisites:

IT 350 or ISYS 350, IT 460

Course Objectives:

This course is intended to provide students with an understanding how important Server operating systems work and how it can be managed effectively. Also, it focuses on design, development and coding of administration and networking software. Implementations include the application programming interface known as sockets. After completing this course the students should be able to configure, secure and administer Servers and Networks and gain hands-on experience through several programming assignments/projects in layered software systems.

- Understand the ethical issues of working as a system and Network Administrator.
- Be familiar with common network operating systems (NOSs) used by network servers.
- Understand directories, directories services, and their uses in a network environment, particularly X.500, LDAP and their derivatives
- Perform various Windows Server installation types such as attended, unattended, and upgrades.
- Configure and maintain the operating system environment and server hardware.
- Outline Active Directory and its key features and benefits.
- Be able to design and implement a Microsoft Active Directory (AD) installation
- Configure and manage users and groups (with both GUI and command-line tools).
- Configure secure access to network resources (shared files and printers).
- Install and configure key services and applications such as DNS, WINS, and IIS.
- Use Group Policy to effectively manage an Active Directory domain.
- Maintain a Windows server and ensure its availability.
- Understand network security issues
- Be able to work as a basic Network Administrator with AD
- Understand client server communication using HTTP protocol
- Develop code for a HTTP server
- Develop

Hands-on experience will be gained through several programming assignments/projects in Layered Software Systems, HTTP Server, UDP (TFTP or DNS), CGI program, IPV6, RPC/SCTP.

**Course Coverage:**

<table>
<thead>
<tr>
<th>Network administration</th>
<th>50%</th>
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<tbody>
<tr>
<td>Network Programming</td>
<td>50%</td>
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</tbody>
</table>

**Course Contents:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Course Intro: Certification; Networks and NOSs; Network Administration responsibilities and ethics</td>
</tr>
<tr>
<td>3</td>
<td>Active Directory, AD Directory Design Tools, Planning the Network File System</td>
</tr>
<tr>
<td>5</td>
<td>Managing Users, Groups and Login Security I LAB: Creating the NDS/eDirectory Directory Tree Structure, the NetWare Network File Structure, and User-Related Objects</td>
</tr>
<tr>
<td>6</td>
<td>Managing AD Trustee Rights Assignments and Directory/File Attributes, Managing Network Login Scripts &amp; User Environments</td>
</tr>
<tr>
<td>7</td>
<td>Managing Applications and Network Printing, Managing Messaging Services</td>
</tr>
<tr>
<td>8</td>
<td>Sockets Programming, TCP Programming, TELNET, HTTP, Authd</td>
</tr>
<tr>
<td>9</td>
<td>UDP sockets, I/O Multiplexing, TFTP</td>
</tr>
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<td>----</td>
<td>--------------------------------------------------------</td>
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<tr>
<td>10</td>
<td>DNS and address conversion, Buffer Overflow, The WWW &amp; Web Programming (CGI)</td>
</tr>
<tr>
<td>11</td>
<td>Client/Server Programming, Advanced Sockets Programming Cookies, JavaScript, XML Handouts, Links</td>
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<tr>
<td>12</td>
<td>Router and Bridge Software, Threads programming, IPV6 Daemons, inetd, SMTP, POP, IMAP, FTP</td>
</tr>
<tr>
<td>13</td>
<td>XDR, RPC Programming</td>
</tr>
<tr>
<td>14</td>
<td>Multimedia Network Programming issues, RTSP, RTP and RTCP Wireless Network Programming Issues</td>
</tr>
<tr>
<td>15</td>
<td>CORBA</td>
</tr>
<tr>
<td></td>
<td>Network Programming issues in different languages</td>
</tr>
</tbody>
</table>

**Catalog Description:**
Topics to be covered in Windows server systems and network administration include: domain administration; file system management; networked printers; user management; and workstation configuration. Also hands-on network programming experience will be gained through several programming assignments/projects in Layered Software Systems, HTTP Server, UDP (TFTP or DNS), CGI program, IPV6, RPC/SCTP.

**Grading:**
- Class Quizzes 10%
- Administration Lab tasks 10%
- Homework and Programming Assignment 20%
- Mid-term 20%
- Course Project 20%
- Final exam 20%

**b. LEARNING OUTCOMES**
After completing this course the students should be able to:
- Be familiar with common system and network operating systems.
- Understand directories, directories services, and their uses in network environment, particularly X.500, LDAP and their derivatives.
- Be able to design and implement a Microsoft Active Directory installation.
- Be familiar with the design and implementation of Novell Directory installation.
- Understand ethical issues of working as a System and/or Network Administrator.
- Understand network security issues.
- Work as a basic Network Administrator.
- Demonstrate mastery of common network protocols: ARP, RARP, Ethernet, IPv4, IPv6, ICMP, TCP, UDP, DNS, HTTP, FTP, SNMP, and SMTP.
- Demonstrate mastery of socket programming.
- Develop network applications such as ftp, remote login (telnet, ssh), and web servers.
- Understand and network commands: netstat, ifconfig, ping, traceroute, tcpdump, sock, telnet, rlogin

c. RESOURCES REQUIRED TO OFFER AND SUPPORT THIS COURSE
Resources currently in place within the department and the University Library will support this new course. No new resources are required.

d. IMPACT ON STAFFING IN THE DEPARTMENT
There is no impact on department staffing.

e. DIFFERENT ASPECT IN 500 LEVEL
Graduate students must do independent research in a topic of current interest. Students are required to write a research paper about their topic and present their findings to the class.