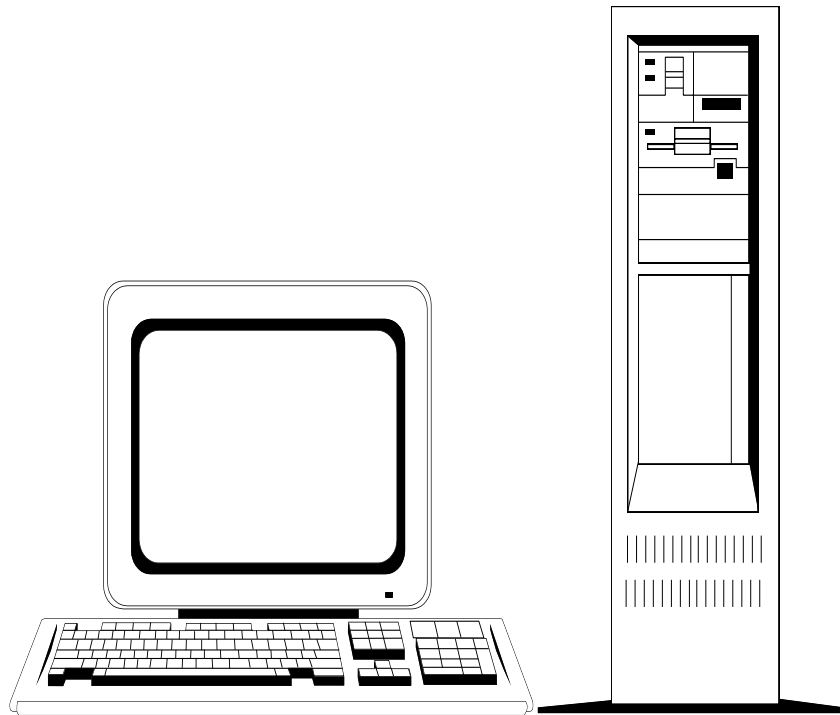


**STUDENT HANDBOOK  
FOR  
COMPUTER SCIENCE RELATED PROGRAMS  
FALL 2008 - SPRING 2009**



**MANSFIELD UNIVERSITY  
DEPARTMENT OF MATHEMATICS AND  
COMPUTER INFORMATION SCIENCE**

Revised 8/26/2008

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## IMPORTANT NOTE:

This version of the Handbook is for students who have officially entered one of the CIS major or CIS minor programs during the semesters that are stated on the cover of this handbook. Every few years, small but significant changes are made to the program regulations. The regulations that were in effect when you declared the major or minor are the regulations that will be applied to determine if you have completed the program of study. If you officially entered the program at any semester other than semesters that are stated on the cover of this handbook, you should use the version of the Handbook that was in effect for your semester of entry into the program.

## Computer Science-Related Programs

There are three computer science-related degree programs and three minors offered by the Department of Mathematics and Computer Information Science. Two of the degree programs grant Bachelor of Science (B.S.) degrees; one with an emphasis (Track) in Computer Science and the other with an emphasis in Information Systems. An Associate of Science (A.S.) degree program in Computer Information Systems is also offered.

The three minors are in Computer Science, Information Systems, and General Computing. See page 10 for a list of requirements for these minors.

It is possible to do a dual major with any other B.S. degree program available at Mansfield. Some Information Systems majors do a dual major with a Business-related program. There is an overlap of courses with the Business Administration major, the Marketing major, and the Accounting major which facilitates the acquisition of both majors within a reasonable timeframe if the student plans his/her program carefully.

Students that major (B.S.) in CS can minor in Mathematics, without a great deal of additional course work. Some of our CS students choose to dual major in Applied Mathematics. Also, students majoring in IS can minor in Accounting or Business Administration with a few additional courses. These dual major and major/minor strategies can be valuable assets when entering the job market.

Many other departments on campus also have minors available. For the details on these programs, contact someone within that department. For additional information on dual majors and minors, see your advisor.

Information about the computer science related programs, including course descriptions can found on the Mansfield University web site at <http://www.mansfield.edu/catalog/>. Additional information on the Computer Information Science department can be found at <http://www.mansfield.edu/~compscie/>.

## **Goals And Objectives**

The overall goals of all of the computer science-related majors and minors are to provide students with the knowledge, skills and attitudes which will enable them to:

- think critically and communicate clearly in order to conceptualize, design and implement computer solutions to real-world problems,
- be prepared for life-long learning so that they can stay current on hardware, software, and systems in this constantly changing field,
- exhibit positive attitudes and values toward the discipline, so that they can contribute to an increasingly complex and dynamic society, and
- have an appropriate set of professional skills to ensure a productive career.

## **Student Outcomes**

Students will:

- learn a problem solving approach through using the computer to solve problems.
- have the ability to program in-depth in at least two representative computer languages.
- develop skills in using a variety of software packages commonly used in organizations.
- have knowledge about the operations of computer hardware and about computer operating systems.
- learn the knowledge and skills needed to understand the organizations in which they will work.
- develop the ability to communicate about their work orally (such as presenting reports) and in writing (such as program documentation).
- develop the ability to assess a situation, communicate with clients, and develop appropriate computer systems to meet the clients' needs.
- understand the role computers have played in shaping our society and potential future roles for the computer; the negative aspects as well as positive.
- understand the ethical and value issues related to their role as computer professionals.

## General Scheduling Advice

For all of the programs, it is essential that you pay close attention to course prerequisites and the sequence in which you take courses. Courses should be taken in the prescribed semester unless there are strong circumstances making that impossible. Some upper-level courses, such as CIS 3300, CIS 3308, CIS 3310, CIS 3311, CIS 3325, CIS 3350, and CIS 4309 are offered on a rotating basis, only once every four semesters. You are responsible for getting these courses when they are offered so that you can graduate on schedule. Likewise, you are responsible for having the proper prerequisites so that you will be able to take such courses when they are offered.

If you are in the Computer Science Track you must be particularly diligent about getting your mathematics requirements completed on a regular schedule. Otherwise, your last two semesters on campus could be heavily scheduled with mathematics courses, causing very difficult semesters of study. Some upper-level mathematics courses, such as MA 3310, are offered on an every-other-year basis. You should be ready to take them when offered, by having completed the course prerequisites early in your course of study.

The B.S. Computer Science degree programs are tailored for a four-year sequence. Many students choose to take a longer time. However, if you have not taken the proper course prerequisites by the time infrequently scheduled courses are offered, it may be necessary for you to be taking these courses after your intended graduation date. By attending summer school, at Mansfield or at other institutions, students can make up credits or perhaps complete the degree requirements in less than four years.

## Major Requirements

### A) B.S. Computer Science Track (120 credits)

#### Core Program Requirements (55 credits)

Cis 1104 Computer Science I (3 credits)  
Cis 2204 Computer Science II (3 credits)  
Cis 2206 Business Programming Concepts I (3 credits)  
Cis 3300 Programming Languages (3 credits)  
Cis 3301 Data Structures (3 credits)  
Cis 3306 Business Programming Concepts II (3 credits)  
Cis 3311 Software Engineering (3 credits)  
Cis 3325 Operating Systems (3 credits)  
Cis 3330 Computer Organization (3 credits)  
Cis 3340 Database Systems (3 credits)  
Cis 3350 Analysis of Algorithms (3 credits)  
Cis 3390 Networking I (3 credits)  
Cis 4490 Networking II (3 credits)

Six credits of major-related electives at the upper-division level (courses numbered 3260 or higher) must also be taken, see page 12. (6 credits)

Ma 3310 Numerical Analysis (3 credits)  
Ma 3314 Applied Probability and Statistics (3 credits)  
Ma 3260 Discrete Structures (3 credits)  
Ma 4401 Seminar: Selected Topics (1 credit)  
    or Ma 4402 Seminar (1 credit by substitution)

#### Other Program Requirements (20 credits)

Ma 2231 Calculus I (4 credits)  
Ma 2232 Calculus II (4 credits)

A natural science laboratory course (4 credits).

In addition, a year-long laboratory science course sequence, preferably Physics, is required (8 credits). You should verify that the science courses you have selected will also qualify for the "Natural Sciences" General Education block.

#### Important Notes:

- 1) All other university degree requirements, such as General Education and completing 48 credits at the upper division level (courses numbered 3260 or higher), must be satisfied.
- 2) The university-wide General Education requirements include the one-credit "First Year Experience Course", as well as the "Information Literacy," "Global Awareness," and "The Writing across the Curriculum" requirements. For the full details of these important requirements consult the "Undergraduate Catalog" and your advisor.

## Suggested Semester Schedule B.S. Computer Science Track

**This Schedule may need to be adjusted to match course availability.**

(Note: This schedule assumes that your first semester will be in the Fall, otherwise minor adjustments will have to be made.)

<u>First Semester</u> (Fall 2008) <u>S.H.</u> CIS 1104 Computer Science I 3 MA 2231 Calculus I 4 ENG 1112 Composition I 3 COM 1101 Oral Communication 3 UNV 1100 First Year Seminar <u>1</u> 14	<u>Second Semester</u> (Spring 2009) <u>S.H.</u> CIS 2204 Computer Science II 3 MA 2232 Calculus II 4 Wellness Elective 3 Humanities Elective 3 Fine Arts Elective <u>3</u> 16
<u>Third Semester</u> (Fall 2009) <u>S.H.</u> CIS 2206 Bus Program Concpt I 3 CIS 3330 Computer Org. 3 MA 3260 Discrete Structures 3 Lab Science 4 Social Science Elective <u>3</u> 16	<u>Fourth Semester</u> (Spring 2010) <u>S.H.</u> CIS 3306 Bus Program Concpt II 3 CIS Upper-Level Elective 3 Lab Science 4 Humanities Elective 3 Social Science Elective <u>3</u> 16
<u>Fifth Semester</u> (Fall 2010) <u>S.H.</u> CIS 3301 Data Structures 3 CIS 3311 Software Engineering 3 MA 3310 Numerical Analysis 3 Lab Science 4 ENG 3313 Composition II <u>3</u> 16	<u>Sixth Semester</u> (Spring 2011) <u>S.H.</u> CIS 3350 Analysis of Algorithms 3 CIS 3325 Operating Systems 3 CIS 3340 Database Systems 3 MA 3314 Appd Prob & Stats 3 General Education Elective <u>3</u> 15
<u>Seventh Semester</u> (Fall 2011) <u>S.H.</u> CIS 3390 Networking I 3 CIS Upper-Level Elective 3 Lang & Lit Elective 3 Social Science Elective 3 Elective <u>3</u> 15	<u>Eighth Semester</u> (Spring 2012) <u>S.H.</u> CIS 3300 Programming Lang. 3 CIS 4490 Networking II 3 MA 4401 / MA 4402 Seminar 1 Lang & Lit Elective 3 Elective <u>2</u> 12

## **B) B.S. Information Systems Track (120 credits)**

### **Core Program Requirements (57 credits)**

Cis 1104 Computer Science I (3 credits)  
Cis 2204 Computer Science II (3 credits)  
Cis 2206 Business Programming Concepts I (3 credits)  
Cis 3301 Data Structures (3 credits)  
Cis 3303 Web Site Design (3 credits)  
Cis 3306 Business Programming Concepts II (3 credits)  
Cis 3308 Operations Research or Bus 3350 Production Management (3 credits)  
Cis 3309 Management Information Systems (3 credits)  
Cis 3310 Systems Analysis (3 credits)  
Cis 3330 Computer Organization (3 credits)  
Cis 3340 Database Systems (3 credits)  
Cis 3390 Networking I (3 credits)  
Cis 4309 E-Commerce Systems (3 credits)

Acc 1110 Principles of Accounting I (3 credits)  
Bus 1130 Intro to Business and Management (3 credits)  
    **or** Bus 2230 Principles of Management (3 credits)

Take one course from the following:

Acc 1111 Principles of Accounting II (3 credits)  
Eco 1101 Principles of Macroeconomics (3 credits)  
Eco 1102 Principles of Microeconomics (3 credits)

Take one course from the following:

Accounting course - Acc 3300 level or higher (3 credits)  
Bus 3330 Marketing

Six credits of major-related electives at the upper-division level (courses numbered 3260 or higher) must also be taken, see page 12. (6 credits)

### **Other Program Requirements (9 credits)**

Ma 1125 Intro to Statistics **or** Ma 3314 Applied Prob & Stat (3 credits)  
Ma 1129 Finite Mathematics **or** Ma 3260 Discrete Structures  
    **or** Ma 3280 Linear Algebra and Matrix Theory (3 credits)  
Ma 1170 Fund of Calculus (3 credits)  
    **or** Ma 2231 Calculus I (4 credits)

### **Important Notes:**

- 1) All other university degree requirements, such as General Education and completing 48 credits at the upper division level (courses numbered 3260 or higher), must be satisfied.
- 2) The university-wide General Education requirements include the one-credit "First Year Experience Course", as well as the "Information Literacy," "Global Awareness," and "The Writing across the Curriculum" requirements.

**Suggested Semester Schedule**  
**B.S. Information Systems Track**

**This Schedule may need to be adjusted to match course availability.**

(Note: This schedule assumes that your first semester will be in the Fall, otherwise minor adjustments will have to be made.)

<p><u>First Semester</u> (Fall 2008)      <u>S.H.</u></p> <p>CIS 1104 Computer Science I      3  ACC 1110 Prin of Acctg I      3  ENG 1112 Composition I      3  COM 1101 Oral Communication      3  Fine Arts Elective      3  UNV 1100 First Year Seminar      <u>1</u>  16</p>	<p><u>Second Semester</u> (Spring 2009)      <u>S.H.</u></p> <p>CIS 2204 Computer Science II      3  MA 1125 Intro to Statistics      3  ACC 1111 Prin of Acctg II      3  or ECO 1101 or ECO 1102  Wellness Elective      3  Social Science Elective      <u>3</u>  15</p>
<p><u>Third Semester</u> (Fall 2009) <u>S.H.</u></p> <p>CIS 2206 Bus Program Concpt I      3  CIS 3330 Computer Org.      3  MA 1129 Finite Mathematics      3  Humanities Elective      3  Social Science Elective      <u>3</u>  15</p>	<p><u>Fourth Semester</u> (Spring 2010)      <u>S.H.</u></p> <p>CIS 3303 Web Site Design      3  CIS 3306 Bus Program Concpt II      3  MA 1170 Fundamentals of Calc      3  BUS 1130 Intro Bus &amp; Mgmt      3  or BUS 2230  Social Science Elective      <u>3</u>  15</p>
<p><u>Fifth Semester</u> (Fall 2010)      <u>S.H.</u></p> <p>CIS 3301 Data Structures      3  CIS 3309 Management Info Sys      3  CIS 3390 Networking I      3  3300-level Accounting Elective      3  or BUS 3330 Marketing  ENG 3313 Composition II      <u>3</u>  15</p>	<p><u>Sixth Semester</u> (Spring 2011)      <u>S.H.</u></p> <p>CIS 3340 Database Systems      3  CIS 4309 E-Commerce      3  Humanities Elective      3  General Education Elective      3  Elective      <u>3</u>  15</p>
<p><u>Seventh Semester</u> (Fall 2011)      <u>S.H.</u></p> <p>CIS 3310 Systems Analysis      3  CIS Upper-Level Elective      3  Lab Science Elective      4  Lang &amp; Lit Elective      3  Elective      <u>3</u>  16</p>	<p><u>Eighth Semester</u> (Spring 2012)      <u>S.H.</u></p> <p>CIS 3308 Operations Research      3  or BUS 3350  CIS Upper-Level Elective      3  Science Elective      3  Lang &amp; Lit Elective      3  Elective      <u>1</u>  13</p>

### C) A.S. Computer Information Systems (60 credits)

#### Core Program Requirements (30 credits)

Cis 1102 Visual Basic Programming (3 credits)

or Cis 1103 Introduction to Microcomputers (3 credits)

Cis 1104 Computer Science I (3 credits)

Cis 2203 Software for Business Applications (3 credits)

Cis 2204 Computer Science II (3 credits)

Cis 3303 Web Site Design (3 credits)

Two additional Computer Science courses, numbered 3300 or higher (6 credits)

Acc 1110 Principles of Accounting I (3 credits)

Acc 1111 Principles of Accounting II (3 credits)

Bus 2230 Principles of Management (3 credits)

#### Other Program Requirements (9 credits)

Eco 1101 Prin of Macroeconomics or Eco 1102 Prin of Microeconomics  
(3 credits)

Ma 1125 Intro to Statistics (3 credits)

Phl 2200 Critical Thinking or Phl 3230 Formal Logic (3 credits)

The university-wide General Education requirements include the one-credit Unv 1100 course, as well as a 3-credit "Information Literacy" course, a 3-credit "Global Awareness" course, and two 3-credit "The Writing across the Curriculum" courses (beyond Eng 1112). For the full details of these important requirements consult the "Undergraduate Catalog" and your advisor.

### Suggested Semester Schedule A.S. Computer Information Systems

<u>First Semester</u>	<u>S.H.</u>	<u>Second Semester</u>	<u>S.H.</u>
ACC 1110 Prin of Acctg I	3	ACC 1111 Prin of Acctg II	3
CIS 1102 or CIS 1103	3	CIS 2204 Computer Science II	3
CIS 1104 Computer Science I	3	CIS 3303 Web Site Design	3
COM 1101 Oral Communication	3	ENG 1112 Composition I	3
Fine Arts Elective	3	PHL 2200 or PHL 3230	<u>3</u>
UNV 1100	<u>1</u>		15
	16		
<u>Third Semester</u>	<u>S.H.</u>	<u>Fourth Semester</u>	<u>S.H.</u>
Bus 2230 Management Prin	3	CIS Elective (3300 & above)	3
CIS 2203 Business Software Appl	3	ECO 1101 Macroeconomics	3
CIS Elective (3300 & above)	3	Gen. Ed. and/or Electives	7
Ma 1125, Intro to Statistics	3	"Wellness" Activity	<u>1</u>
Gen. Ed. and/or Electives	<u>3</u>		14
	15		

Note that of the total of 10 credits listed above as "Gen. Ed. and/or Electives", at least 5 of these credits must be from courses in the General Education Groups #1 through #5, and the remaining credits can be freely chosen.

## Minor Requirements

### A) Computer Science Minor (18 credits)

Cis 1104 Computer Science I (3 credits)  
Cis 2204 Computer Science II (3 credits)  
Cis 3301 Data Structures (3 credits)  
Cis 3330 Computer Organization (3 credits)  
Six credits of additional Computer Science courses, numbered 3300 or higher.

#### **Suggested Sequence**

Cis 1104  
Cis 2204, Cis 3330  
Cis 3301

The two additional Computer Science courses should be scheduled after prerequisites are completed.

### B) Information Systems Minor (18 credits)

Cis 1102 Visual Basic Programming (3 credits)  
Bus 1130 Intro to Business and Management (3 credits)  
    **or** Bus 2230 Principles of Management  
Cis 2203 Software Applications to Business (3 credits)  
Cis 3303 Web Site Design (3 credits)  
Cis 3309 Management Information Systems (3 credits)  
Cis 3310 Systems Analysis (3 credits)

Note that Cis 3310 (Fall) is only offered every other academic year.

### C) General Computing Minor (18 credits)

Students must take two of the three courses listed below: (Cis 1102, 1103, 1104)  
Cis 1102 Visual Basic Programming (3 credits)  
Cis 1103 Introduction to Microcomputers (3 credits)  
Cis 1104 Computer Science I (3 credits)

Cis 2203 Software Bus. Applications or Cis 2204 Computer Science II (3 credits)  
Cis 3303 Web Site Design (3 credits)  
Two additional courses (6 credits)

The two additional courses can be other Computer Science courses, or courses which relate to the use of computers in the student's major, or other courses where there is a major component of computer use as part of the course content. Please note that departmental approval is required for such non-CIS courses. Also note that this minor is not available to students majoring in CIS.

#### **Suggested Sequence**

Cis 1103, Cis 1104  
Cis 2203 or Cis 2204, CIS 3303

The two additional courses should be scheduled as appropriate, following approval.

## Prerequisites of Computer Science Courses

The following is a list of Computer Science courses and their prerequisites. The Computer Science faculty requires prerequisites to be completed before taking any course. Course content and course assignments will assume the completion of these prerequisites.

<b>Course Number and Title</b>	<b>Prerequisites</b>
Cis 1101 Computers in Society	None
Cis 1102 Visual-Basic Programming	None
Cis 1103 Introduction to Microcomputers	None
Cis 1104 Computer Science I	None
Cis 2203 Software for Business Applications	None
Cis 2204 Computer Science II	Cis 1104
Cis 2206 Business Programming Concepts I	Cis 1104
Cis 3300 Programming Languages	Cis 2204, Cis 3330
Cis 3301 Data Structures	Cis 2204
Cis 3303 Web Site Design	None
Cis 3306 Business Programming Concepts II	Cis 2206
Cis 3308 Operations Research	(Ma 1125 or Ma 3314), (Ma 1129, Ma 3260, or Ma 3280), (Ma 1170 or Ma 2231), and (Cis 2204 or Cis 2203)
Cis 3309 Management Information Systems	Cis 1104 or Cis 2203
Cis 3310 Systems Analysis	Bus 1130 or Bus 2230, Cis 2203 or 2206
Cis 3311 Software Engineering	Cis 3301 (corequisite allowed)
Cis 3314 Automated Accounting	Acc 3315; Cis 2203
Cis 3320 Computer Architecture	Cis 3330
Cis 3325 Operating Systems	Cis 3301, Cis 3330
Cis 3330 Computer Organization	Cis 1104
Cis 3340 Database Systems	Cis 3301, Cis 3306
Cis 3350 Analysis of Algorithms	Cis 3301
Cis 3390 Networking I	Cis 2204, Cis 3330
Cis 4309 E-Commerce	Cis 3309
Cis 4420 Special Problems	(Depends on Topic - Permission of Instructor)
Cis 4430 Program Translation	Cis 3301, Cis 3330
Cis 4440 Artificial Intelligence	Cis 2204
Cis 4441 Switching Theory	Cis 2204, Cis 3330
Cis 4450 Internship	Junior/senior status and 15 Cis credits completed are preferred
Cis 4490 Networking II	Cis 3330, Cis 3390

## Major-Related Electives

For students in the Computer Science and Information Systems Tracks, only upper-division level courses (courses numbered 3260 or higher) may count as major-related electives.

Computer Science Track students should select major-related electives from Computer Science courses. Upon close consultation with your advisor, a set of related courses from mathematics or physics might also be counted.

Information Systems Track students should select major-related electives from Computer Science, Accounting or Business courses. Courses other than Computer Science electives should be selected only after close consultation with an advisor. Such selections should form a set of related courses. As examples: three upper-level accounting courses or three upper-level management courses. However, one accounting course, one management course, and one finance course would not constitute an acceptable set of major-related electives, even though these three courses all are offered by the same department.

Up to six credits of Computer Science/ Information Systems internships may count as major-related elective credits, although twelve can be used toward the overall degree.

*The Choice of Major Related Electives Should Relate to Some Coherent Career Objective* rather than being merely a collection of individual courses. Work closely with your advisor in making your choices. Unless you have a strong reason for doing otherwise (i.e., a well thought out career direction) major-related electives should be selected from Computer Science courses.

## Internships

Information Systems Track students and Computer Science Track students may take a maximum of two internships through the CIS 4450 Organization Internship course. These internships can have a maximum total of 12 credit hours. Of these 12 credits, a maximum of 6 credits can be used as "Major Related Electives."

Internships are normally done after the student has completed 15 credits of computer science courses, but exceptions can be made. Associate degree students can also qualify for internships, usually in their second year of study. Fall and Spring semester internships are usually done within driving distance of the Mansfield area on a part-time employment basis, while the student takes regular classes. Summer semester internships are often done on a full-time employment basis, perhaps near the student's home.

Although some students find their own internship situations (subject to approval), there are many opportunities for internships that can be arranged through the department. We have active internship programs with large national corporations, such as State Farm Insurance (Illinois), as well as with local employers, such as Intelligent Direct (Wellsboro) and Information Technology (on campus).

Over the five years ending in 2006, more than 75% of our graduates had completed at least one internship. Over the same time period, more than half of our graduates had multiple internships. However, the better your grades are, the better your chances are to secure a high-quality internship. These internships are an extremely valuable part of your education, and they have been creating valuable full-time employment opportunities for many of our students. See your advisor or any one of the Computer Science faculty members if you are interested in exploring the possibility of an internship.

## **Other Professional Opportunities**

### **Computer Science Club:**

Mansfield has a Computer Science Club advised by the Computer Science faculty. This club provides an opportunity for social interaction with other students interested in computers. The club also provides many valuable opportunities for learning well beyond the limits of the classroom. Field trips and attendance at the statewide conference of SSHE computer educators are additional experiences offered through the Computer Science Club. Currently the Computer Science club manages the Mansfield University student web-server. The student web-server provides an opportunity for all students of the university to have a homepage on the world wide web, but students, who are interested, can be involved with management of the site. This is a tremendous educational opportunity as well as some fun. The club is as active as the student members make it.

### **Work Study Employment:**

Many Computer Science students get campus work as computer lab consultants, computer tutors, and computer maintenance technicians with our on-campus Information Technology group. These work experiences enhance the students' knowledge and skills beyond what is available from your course work.

## **Tentative Course Offerings**

### **Fall Semester, 2008**

Cis 1102, Cis 1103, Cis 1104  
Cis 2203, Cis 2206  
Cis 3301, Cis 3303, Cis 3309, Cis 3311, Cis 3330, Cis 3390

### **Spring Semester, 2009**

Cis 1103, Cis 1104  
Cis 2203, Cis 2204  
Cis 3303, Cis 3306, Cis 3325, Cis 3340, Cis 3350  
Cis 4309, Cis 4420, Cis 4490

## **Tentative General Scheduling Information**

### **Courses offered Every Semester:**

Cis 1103, Cis 1104, Cis 2203, Cis 2204, Cis 3303

### **Courses offered Fall Semester Only:**

Cis 1102, Cis 2206, Cis 3301, Cis 3309, Cis 3330, Cis 3390

### **Courses offered Spring Semester Only:**

Cis 3306, Cis 3340, Cis 4490

### **Courses offered on a rotating basis, Every Four Semesters Only:**

*Fall Semester Even Years*

Cis 3311, Ma 3310

*Spring Semester Even Years*

Cis 3300, Cis 3308

*Fall Semester Odd Years*

Cis 3310

*Spring Semester Odd Years*

Cis 3325, Cis 3350, Cis 4309

(NOTE: You should take the prerequisites for these courses as soon as possible, so that you will be ready for these courses when offered!)

Each student should have a Degree Audit form available on WebAdvisor. See your advisor for information.