

COSC171 Problem Solving with Computers

Fall 2009
Everyday – 8:00
Office Hrs. by appointment

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Special thanks to Drs. Gene Chase, Barry DeRoos and Bob Barrett who inspired this syllabus and cooperated to improve each project.

COURSE DESCRIPTION

A broad and hands-on exposure to the capabilities and uses of the computer. In this course you will study a number of problems that computers can solve and various tools [programs or applications] used for these solutions. There will be an emphasis on application programs like spreadsheets, databases, and the Internet.

You will be learning about computer vocabulary, culture, and artificial intelligence to better adapt you for life and work in the 21st century.

PREREQUISITES

There are **no** prerequisites to COSC171. No previous experience with computers is assumed. This course satisfies the three hour general education requirement for a course in mathematical sciences.

MATERIALS

1. A three ring notebook with the labs for this course.

Laboratory assistants are available in Frey 166 during posted hours. When they are available, please see them before seeing me for help with problems. Some help is available at the mathematics help room (Frey 351) Monday through Thursday evenings.

GOALS

- To practice problem solving using computer software.
- To learn the Windows operating systems to format disks, and store, copy, delete, and organize files.
- To learn the HTML language and how to make attractive web sites.
- To learn about graphics programs.
- To use spreadsheets [Excel] to solve numerical problems and to present data graphically.
- To practice elementary database operations.
- To learn about computer culture and what the computer can and can not do...

GRADING

2 Exams + equally weighted final ~30%

13 Projects ~70%

Number Grades into Letter Grades		
	92.5 & above → A	90 → A-
87.5 → B+	82.5 → B	80 → B-
77.5 → C+	72.5 → C	70 → C-
67.5 → D+	65 → D	below 65 → F

Grading keys for all the labs can be found on my website:
<http://home.messiah.edu/~ltaylor/keys.html>

COURSE POLICIES:

- Attendance will be taken at every class.
 - Each student is expected to be present for every class.
 - Each student is responsible for the material covered and the announcements made at every class. If you are sick, have another student take notes for you and pick up any handout sheets for you. A grade deduction will be used of 2.5 points per class for unexcused absences above 1.
- Every laboratory report must be your own original work. **PLAGIARISM IN ALL FORMS MUST BE AVOIDED.** Use quotes when using material written by others and use footnotes for closely allied material. This includes information and graphics from the web.
- All written work is to be submitted on or before the due date. Late assignments are penalized at 10% per class. Assignments are due at the *beginning* of the class. Assignments that are not handed in in the first 10 minutes of class will be penalized 3 points.

PROJECTS:

General Computer Knowledge:

Windows Explorer - the Kitchen Analogy - getting used to the computer environment and **backing up** your work carefully.

2 labs on **Pixel Graphics** with Paint Brush, Paint Shop, Photo Shop and integration into a Word Processor.

The Internet:

Design a website

Learn **HTML language** so that you can create the website you designed.

Logo Programming language:

Learn to use Logo, a graphics based language.

Learn about Logo animation.

Spread Sheets:

Personal Budget - a Spread Sheet - spending graphs - bar and pie

Buying a car - load repayment - 2 vs. 3 years repayment & change in interest rate

Credit Card Dangers

Database:

Creating your record/CD Inventory List

RULES FOR COMPUTER PROJECTS

You will be able to do all of your computer work in any computer lab on campus and most of them on your own computer. Please put your name, the date, the class, and the project number and name in the middle of the first sheet. You may hand letter your name etc. Your project **MUST be STAPLED at the top left** of the paper.

Please hand in professional projects with a nice cover page as follows and neat well organized follow-up pages.

The diagram shows a rectangular box representing a project cover page. In the top-left corner, there is a small diagonal line and the word "staple". In the center, the following text is arranged vertically: "Name", "Lab # and name", "Date", and "COSC171 A or B". At the bottom, there is a rounded rectangular box containing the text "a clever graphic never hurt".

The General Education program at Messiah College is carefully structured around clear College-Wide Educational Objectives. The following are those objectives and how this course fulfills them:

1. To introduce students to the methods and philosophy of the mathematical sciences.

The lecture/lab format of this class exposes students to computer science philosophy and methodology.

2. To introduce students to at least one of the three mathematical sciences of computing, mathematics and statistics from a liberal arts perspective.

The goal of the course is to give the students a practical understanding of computer science and mathematics, and hard experience in using them. It will encourage them to place this knowledge and the skills gained from it in the context of their own prospective classroom experiences and it will suggest ways in which to use these skills in practical ways, e.g., for lesson planning or grade assignment. This course covers computer history, and requires writing and research. Students must gather, use and apply both written and visual information.

3. To help students develop logical, analytical, and abstract thinking through quantitative problem solving activities.

A concrete example of the way this course meets the above objective is the Spread sheet unit. Spreadsheets require students to logically solve a problem which involves math and use formulas and other tools to format and analyze data.

Another example of problem solving in this course is LOGO programming language which helps students learn to solve problems. LOGO requires students to use spatial reasoning, logically analyze a problem and break it down into it's simplest parts, and apply programming concepts and commands to solve the problem. Students will learn to think spatially to figure out how to get the computer to draw specific figures and then translate those movements into commands in the LOGO programming language. They will learn the use of variables, vital to any computer programmer, to make some of the shapes. They will learn to apply the use of variables to the shapes they needed to create. They learned to use discrete procedures to solve each problem, another vital tool for all computer programmers.

4. To integrate student use of the computer as a tool in the pursuit of the above two objectives.

This course is entirely computer based. Students will use computers for all the research, writing and problem solving the course requires