Instructor: Dr. Frank McCown
Contact: 501-279-4826, HU Box 10764, fmccown@harding.edu
Home Page: http://www.harding.edu/fmccown/classes/comp170-s10/ (Syllabus, useful links)
Office Hours: Science 208: 4:15 – 5:15 MW, 1 – 4 TR, 3 – 5 F or by appointment

Course Description

Fundamental concepts of problem solving and computational algorithms will be covered as well as an overview of the computer science field. Using the C++ programming language, a study will be made of language syntax, program control flow, algorithm implementation and modular program design, data types and structures, and file input and output. Computer science topics to be examined include machine architecture, operating systems, algorithm analysis and design, programming languages, software engineering, and artificial intelligence.


Tutoring: Sci 201 Computer Lab. Tutor hours are mostly in the evening and on weekends. Tutors are upper-class computer science majors who have completed this course and more advanced programming courses. If you ever have problems getting help from a tutor, please contact me.

Attendance

You are expected to be in class every day. You may have four “free skips,” but each unexcused absence after that will result in 0.5% being subtracted from your final grade. Attendance will be taken daily at the beginning of class. If you are late, it is your responsibility to see me after class. Absences that are excused (illness, school sponsored trips, etc.) will not be held against you. Those who attend class regularly will usually do much better than those who miss frequently. After missing a class, it is your responsibility to get the notes from a classmate and get any assignments and handouts from me. I will not redo a lecture for someone missing class although I’d be happy to explain things further to you during scheduled office hours.

Exams

Four hour long exams (100 points each) will be given along with a cumulative final exam (150 points). If you are unable to take an exam as scheduled due to a serious illness or some other emergency, it is your responsibility to call me and leave a message before the exam or as soon as you are physically able. If an official school function takes you out of class on an exam date, it is your responsibility to make arrangements one week prior to the exam as to when you will take the exam. Usually it will be given early, not late.

Homework and Labs

There will be 2-4 homework assignments and in-class labs each week. Homework and labs are due at the beginning of the class period the day after they are assigned. The homework is to be completed individually, but most labs are to be completed in pairs (2 people). Partners will be assigned later in the semester.

Pair programming has been shown to have a number of benefits including increased personal satisfaction and fewer errors, and it helps most students perform better when first learning to program. When working in pairs, both of you must work together on a single computer, and both of you must write approximately half of the code. No code can be written without the other partner present and watching. Both of you should understand completely what is being written.

Programming Projects

There will be approximately five programming projects. You will usually be given one to two weeks to complete each project. These are major assignments which will require dedicated effort and time to complete. You will use Microsoft Visual Studio .NET 2008 to write the programs; it
is installed on all machines in the classroom and 201 lab. To obtain a free copy of VS .NET to install on your own computer, first complete the Student Use Agreement and then follow the instructions given on the MSNAA - How to access the software handout (both are available on the class website).

You may work independently on your major projects or in pairs (with your assigned partner or someone else). When you submit a program that has been written in pairs, you must document at the top of the program the names of both individuals who worked on the program. Only one student should submit the program.

Class Presentations

Each of you will need to give a 5 minute class presentation on some current event or subject of interest related to computing. All presentation subjects must be okayed by me at least 24 hours before the talk. You will not be allowed to use PowerPoint, so you’ll need to rehearse your talk well before giving it. The presentations will be scheduled throughout the semester.

Extra Credit

You will receive 0.1% points extra credit added to your final grade for each Computer Seminar that you attend. Seminar meets every Friday at 7:05 am in Science 113. The first seminar will begin around the 3rd week of the semester. There will be approximately 11 seminars, thus allowing you to increase your final grade by 1.1%. See http://www.harding.edu/comp/calendar.html for the complete schedule.

The McChallenge: 1% will be added to your final grade for the completion of a program which will be made available to you later in the semester. The program will be due the Friday before final exams. You can skip the program and still get the 1% added to your final grade if you beat me in a game of basketball, tennis, racquetball, Halo, chess, Trivia Pursuit, or any other sport/game that I know how to play. If you lose, you still may complete the program to get your 1%. Only one challenge per semester, and all challenges must be made before the final week of class. Come by my office to schedule a time to play.

Grades

Final grades will be computed as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>40%</td>
</tr>
<tr>
<td>Projects</td>
<td>25%</td>
</tr>
<tr>
<td>Homework and Labs</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>15%</td>
</tr>
</tbody>
</table>

Standard letter grades: A = 90-100%, B = 80-89% C = 70-79%, D = 60-69%, F = 0-59%

Late work: A maximum of 10% will be taken off each day (not each class period) a program or assignment is late, up to 50%. Every day is counted, including weekends. Nothing late more than 1 week will be accepted.

Expectations

1. It is important that you check your e-mail regularly (everyday) because I occasionally give hints or corrections to homework assignments via e-mail. This is also the best way to communicate with the class outside of the classroom.

2. I expect every one of you to hold to the highest standard of personal conduct and integrity. Cheating in all its forms is inconsistent with Christian faith and practice and will result in sanctions up to and including dismissal from the class with a failing grade. Homework should be completed individually (not in teams or pairs). One thing that you should never do is give someone your source code… this often leads to cheating. Come by during office hours (or we’ll arrange a time) for assistance on programs. Also take advantage of the tutor who will be available several times a week.

3. I expect you to adhere to the dress code as spelled out in the Student Handbook. This includes men removing caps while in class.

4. There is no food or drink prohibited in the lab. The lab has expensive equipment and carpeting that is easily spoiled by an accident.

5. Lab computers may be used during class to take notes and write programs. They may not be used for any other purpose including instant messaging, e-mail, surfing the Web, Facebook, games, etc. Students who break this rule will not be allowed to use the lab computers.

6. Silence your cell phones.

Computer science is one of the most fascinating fields you can study and currently has the most stable and satisfying job market available. It is, however, a science and as such requires a dedicated effort to master. Computer science is certainly an exciting and enjoyable field, but it cannot be mastered without persistence and practice. You should expect to struggle with some of the difficult concepts in this course, but do not give up. It is possible to master the material, but you will have to work diligently to do so. Those who do the best in this course attend
class regularly, turn in homework and assignments on time (because they didn’t procrastinate), and seek help from the tutor or myself when in a rut. Remember that I am here to help you.

Assessment

Harding University, since its charter in 1924, has been strongly committed to providing the best resources and environment for the teaching-learning process. The board, administration, faculty, and staff are wholeheartedly committed to full compliance with all criteria of the Higher Learning Commission of the North Central Association of Colleges and Schools. The university values continuous, rigorous assessment at every level for its potential to improve student learning and achievement and for its centrality in fulfilling the stated mission of Harding. Thus, a comprehensive assessment program has been developed that includes both the Academic units and the Administrative and Educational Support (AES) units. Specifically, all academic units will be assessed in reference to the following Expanded Statement of Institutional Purpose: 
The University provides programs that enable students to acquire essential knowledge, skills, and dispositions in their academic disciplines for successful careers, advanced studies, and servant leadership.

Assessment of the knowledge, skills, and dispositions of each student for the purpose of assigning a letter grade at the completion of this course will be based on the projects, homework assignments, and exams that were described previously in this syllabus. Near the completion of your major in the department of Computer Science, you will be assessed by a comprehensive examination covering core courses in your major, including this course. This examination will influence your final grade in the senior capstone course.

Students with Disabilities

It is the policy for Harding University to accommodate students with disabilities, pursuant to federal and state law. Therefore, any student with a documented disability condition (e.g. physical, learning, psychological, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the instructor and the Disabilities Office at the beginning of each semester. (If the diagnosis of the disability occurs during the academic year, the student must self-identify with the Disabilities Director as soon as possible in order to get academic accommodations in place for the remainder of the semester.) The Disabilities Office is located in Room 102 of the Lee Academic Center, telephone, (501) 279-4019.

Schedule

The following schedule is subject to change but gives you an idea of how the class will progress:

Week 1  Introductions  Week 2  Algorithms and flowcharting  Week 3  Input, output, assignment
  Brief history of computing  Binary numbers  Lab 1 - Compile and run
  Hardware and software basics  C++ history and syntax intro
  Exam 1  Machine architecture

Week 4  Arithmetic expressions and ops
  C++ logical conditions  if and if-else statements

Week 5  while and do-while statements
  Lab 2 – Flow chart to code
  Review Program 1

Week 6  Nested ifs and loops
  Lab 3 – Ave, min, and max
  for loops and switch statements
  Programming languages
  Exam 2

Week 7  Chars and complex conditions
  Lab 4 – Nested ifs and chars
  Data validation
  Review Program 2

Week 8  Intro to functions
  Functions that return values
  Lab 5 – Debugger
  Output parameters
  Lab 6 – Functions

Spring Break

Week 9  Review Program 3
  Intro to arrays
  Lab 7 – Arrays
  Operating Systems
  Exam 3

Week 10  Sorting algorithms
  Parallel arrays
  Searching arrays
  Lab 8 – 2D arrays
  2D and 3D arrays

Week 11  Review Program 4
  Intro to strings
  C string functions
  C++ string functions

Week 12  Lab 9 – Strings
  String streams
  Software engineering
  Exam 4

Week 13  Intro to files
  More files
  The Web and HTML
  Lab 10 – File I/O
  Review Program 5

Week 14  Intro to structs
  Constructors and methods
  Lab 11 – Structs and files

Week 15  Intro to pointers
  Dynamic memory allocation
  Linked list

Week 16  Final Exam

“Whatever you do… do all to the glory of God.” - 1 Corinthians 10:31