CS/ECE 151 – Introduction to Programming I with Embedded Control Lab

Catalog Description: Thorough treatment of the basic elements of C, bitwise operations, flow of control, input/output, functions, arrays, strings, and structures.

Credits: 4 Terms Offered: Winter, Spring

Prerequisites: MTH 111, MTH 112, MTH 251, MTH 251H, or MPT score > 23

Courses that require this as a prerequisite: None

Structure: Three 50-minute lectures and one 110-minute lab per week

Instructors: Chris Wallace

Course Content:
- Identifiers
- Variables of type char, int, float, double, enum, and struct
- Storage classes auto, static and extern
- Assignment, arithmetic, logical, and relational operators
- Expressions & statements
- Flow of control including while, for, do-while, if-then-else, and switch
- C-libraries including stdio.h, stdlib.h, ctype.h, math.h, string.h
- Functions including call-by-value and call-by-reference
- 1- and 2-D arrays
- Typedef, pointers
- Strings
- Structures and unions
- Basic file I/O

Learning Resources:

Measurable Student Learning Outcomes:
At the completion of the course, students will be able to...
1. Write a program to include and use library functions such as those in the <stdio.h>, <stdlib.h>, <math.h>, <ctype.h>, and <string.h> standard C libraries. (ABET Outcomes: I)
2. Write a program that uses expressions involving variables and constants combined with the arithmetic, relational, logical, and/or assignment operators including expressions with mixed data. (ABET Outcomes: I)
3. **Write** a program that alters the sequence of execution using control statements involving selection (switch), condition (if-else, ?:), and repetition (for, while, do-while). (ABET Outcomes: I)
4. **Write** a program that includes one or more user-defined functions with input formal parameters and for which a written specification is given. The program will include function prototypes and calls to the function(s). (ABET Outcomes: I)
5. **Write** a program that uses 1- or 2-dimensional arrays for storing and retrieving collections of data of one of the basic C types. (ABET Outcomes: I)
6. **Write** a program that manipulates strings via pointers and uses pointer types for passing string or other array data, by reference, to functions. (ABET Outcomes: A, I, b)
7. **Write** a program that creates a new structured data type using typedef, reads and /or writes data of this type from or to a file and passes data of this type to one or more functions. (ABET Outcomes: I)

Revised: 1/11/11

**Evaluation of Student Learning:**
- 30% Assignments
- 20% Recitations (Labs)
- 30% Midterm Quizzes
- 20% Final

**Students with Disabilities:**
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

**Link to Statement of Expectations for Student Conduct**, i.e., cheating policies
http://oregonstate.edu/admin/stucon/achon.htm