ECE 114 - 05 C for Electrical Engineers
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Office: BLDG 9 – 407B
Office Hours: M, W 1:00 PM - 2:30 PM, TH 2:00 PM - 4:00 PM
Class Time/Place: Tuesday: 1:00 PM -3:50 PM / BLDG 9-205
Quarter: Fall 2014

Course Description:
Computer programming for ECE. Problem-oriented computer language applications to electrical networks.
Prerequisites: MAT 114, Co-requisite: ECE 114L

Course Outcomes
• Present computer solution to an engineering problem using a pseudo-code notation and then transform the same into a readable C++ program.
• Express a math expression using of C++ operators.
• Use structured programming principles such as go-to-less programming (by properly embedding a set of primitive one-entry-one exit structures) and step-wise refinement in developing code.
• Encapsulate a task by writing a suitable C++ function.
• Evaluate the trade-off between value and reference parameters.
• Exploit global variables in order to save parameter passing overhead.
• Model vectors and matrices using arrays.
• Employ pointer mechanism in order to expedite code execution.
• Perform low level operations such as to set, clear and test a specific bit in an integer using bitwise operators.
• Model a vector in a three-D space using structures.
• Swap bytes and nibbles using unions

Text Book:

Further Reading(s):

Course Requirements and Evaluation Procedure
1. Homework(s)/Computer Assignment, Quizzes: Homework/computer problems will be assigned ahead of time so that students would have chance to read the related topic(s). Homework/computer problems assignments will be collected online on the date specified date. Absolutely no late homework/computer problems will be accepted, if not accompanied with a
legitimate excuse. All work on the homework/computer problems assignments must be individual.
Homework/computer problems affect 10% of the final course grade.
Quizzes affect 20% of the final course grade.

2. **Final project Presentation** affects % 10 of the final grade
3. **Exam(s)** : Midterm affects the 25% of the final course grade,
   Final Exam affects the 25% of the final course grade.
4. **Lab Score**  
   Plus 10% overall lab score

**Note** : Students are responsible for all materials/announcements presented in class whether they are present or absent.

**Brief list of topics to be covered**
1. Fundamentals of computer programming and program development environment (Microsoft Visual Studio 2013).
2. Designing simple C-programs (with basic I/O operations).
3. Introduction pre-complier directives such as #define, #ifdef and #include
4. Primitive data types, constants, variables, operators and arithmetic expressions.
5. Structured programming in C.
   a. Blocks
   b. Selective execution (if -else & switch)
   c. Repetitive execution (while, for and do- while loop structures)
6. Task encapsulation via writing functions.
7. Scope rules and user defined macros.
8. Derived data types
   a. Arrays
   b. Pointers
   c. Strings
9. Introduction to Bitwise operators.
10. Introduction to structures and unions.
11. Introduction pre-complier directives such as #define, #ifdef and #include

**Draft Schedule**

**Week 1**

*Introduction to Computers*
- Definition of Computer
- Evaluation of Operating Systems
- History of Computer Languages, C and C++
- C++ Standard library
- Introduction to C++ Programming
- Simple Program Examples

**Week 2**

*Introduction to C++ programming*
- Memory Concepts
- Arithmetic
- Decision Making
- Examples
- Homework .1
Week 3

Control Statements
- Algorithms
- Pseudocode
- if, if .. else, while
- Examples
- Assignments Operators
- for, switch, do .. while, break, continue
- Logical Operators
- Examples
- Homework .2

Week 4

Functions
- Math Library Functions
- Function Prototypes
- Header files
- Random number generation
- Storage Classes
- Scope Rules
- Examples
- Homework .3

Week 5

Recursion, Iteration
- References
- Function Overloading
- Function Templates
- Examples
- Midterm

Week 6

Arrays
- Declaring Arrays
- Passing Arrays to Functions
- Examples
- Homework .4

Week 7

Sorting Arrays
- Searching Arrays
- Multiple-Subscripted Arrays
- Examples
- Homework .5

Week 8

Pointers and Strings
- Pointer Variable Declaration
- Pointer Operators
Calling Functions
Using the const
Bubble Sort
Pointer Expressions and Arithmetic
Examples
Homework .6

Week 9
Arrays of Pointers
Function Pointers
Characters and Strings Processing
Terminal and File I/O using C-library functions
Examples

Week 10
Final project presentation

Week 11
Final Exam (Tuesday 12-11-2014 11:30 AM -1:30 PM)

Course Policies
• Students are encouraged to discuss the course, including issues raised by the assignments. However, the solutions to assignments should be individual original work unless otherwise specified. You may ask a fellow student a question designed to improve your understanding, not one designed to get the assignment done. To do otherwise is to cheat yourself out of understanding, as well as to be dishonorable.
• Any substantive contribution to your solution by another person or taken from a publication should be properly acknowledged in writing. Anything taken from a source outside the team should be properly cited. Failure to do so is stealing and will require disciplinary action.
• Any form of cheating in the test or quiz will result in a zero score for the test or quiz. Also, the case may be forwarded to the Department Chair for appropriate disciplinary action.