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| **Course** | ECE 22900 – C/C++ Programming for Electrical and Computer Engineering |
| **Type of Course** | Required for the CmpE and EE programs |
| **Catalog Description** | An introductory course on the programming in C and fundamentals of object-oriented programming in C++, with emphasis on applications in electrical and computer engineering. Topics include files, structures, arrays, pointers, and the proper use of dynamic data structures. Introduction on object-oriented programming using C++ language is also included. Students are expected to design and test software programs to solve engineering problems. |
| **Credits** | 4 |
| **Contact Hours** | Class: 3; Lab: 2 |
| **Prerequisite Courses** | ENGR 12800 or equivalent course of computer programming |
| **Textbook** | S. Prata, *C Primer Plus*, Pearson, current edition.  S. Prata, C*++ Primer Plus,* Pearson, current edition. |
| **Course Objectives** | This course introduces the C programming language. Topics include data types and structures, control structures, standard input/output, file input/output, functions, arrays, pointers, and dynamic memory. Fundamental object-oriented programming concepts in C++ such as data abstractions and inheritance are also covered. Students are expected to solve problems in electrical and computer engineering field using software tools in C/C++. |
| **Course Outcomes** | On successful completion of this course, students should be able to:   1. Read and write C programs that use conditional statements and loop structures. **(1)** 2. Read and write C programs that use standard input/output and file input/output. **(1)** 3. Read and write C programs that use arrays and pointers. **(1)** 4. Read and write C program that use structures. **(1)** 5. Read and write C program that use dynamic data structures. **(1)** 6. Read and write simple object-oriented programs in C++. **(1)** 7. Understand the concepts of inheritance and polymorphism. 8. Use a standard C/C++ program development environment for editing, testing, and debugging. **(6)** 9. Use C/C++ programs to solve basic engineering problems. **(1)** |
| **Lecture Topics** | * 1. Introduction to C   2. Basic data types   3. Standard input/output   4. Operators, expressions, and statements   5. Control statements: looping and branching   6. Functions   7. Arrays and pointers   8. Dynamic memory management   9. File input/output   10. Structures   11. Introduction to C++   12. Objects and classes   13. Function overloading and operator overloading   14. Templates and standard template library   15. Class inheritance |
| **Computer Usage** | High |
| **Laboratory Experience** | None |
| **Design Experience** | High |
| **Coordinator** | Chao Chen, Ph.D. |
| **Date** | October, 2021 |