CSCI 140 Outline

C++ LANGUAGE AND OBJECT DEVELOPMENT

TEXT: C++ How to Program by H. Deitel & P. Deitel, 10th Ed Prentice Hall, 2017

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| **Topics** | **Sections** | **Time** |
| Hardware and software, computer organization, high level languages, operating systems, C++ and IDE, first simple program in C++, preprocessor directives (#include, #define), macros, arithmetic, memory concepts, relational operators, intro to classes OOP, constructor, member function, data member, set/get | 1.1 - 1.14  2.2 - 2.7  3.1 - 3.8 | 5 Hours |
| Algorithms, pseudo-code, control structures, selection structures (if, if/else, and switch), repetition structure (whilte, for, and do/while), assignment operators, increment and decrement operators, relational operators, logical operators, break and continue, typedef and bitwise operators | 4.1 - 4.12  5.1 - 5.10  21.2 - 21.6 | 5 Hours |
| Functions: standard library functions and user-defined functions, function prototypes, function definitions, function calls, scope rules, storage classes, passing parameters by value and by reference, default arguments, recursive functions, inline functions, function overloading | 6.1 - 6.21 | 4 Hours |
| Arrays, Pointers and Strings: one-dimensional and multidimensional arrays, array applications (sorting and searching), pointer variables, pointers vs. arrays, pointer arithmetic, arrays of pointers, function pointers (optional), passing arrays to functions, character and Cstring processing, character and string libraries (optional) | 7.1 - 7.11  8.1 - 8.12 | 3 Hours |
| Classes: structure vs. class, encapsulation, class scope, controlling access to members (public and private), constructors, destructors, interface and implementation files, software reusability, constant objects and constant member functions, friends, the "this" pointer, static class members, composition, data abstraction, information hiding, dynamic memory allocation/deallocation (new and delete) | 9.1 - 9.10  10-1 - 10.7 | 5 Hours |
| Operator overloading: fundamentals and restrictions, overload as member functions vs. as friend functions, stream-insertion and stream-extraction operators, overloading unary operators and binary operators, copy constructor, converting between types, ease study: array class, C++ strings | 11.1 - 11.14 | 3 Hours |
| Inheritance and Polymorphism: base class and derived classes, protected members, basecalse pointers and derived-class pointers, overriding, composition vs. inheritance, multiple inheritance, virtual functions and pure functions, abstract base classes and concrete classes, static binding vs. dynamic binding, virtual destructors, the v-table | 12.1 - 12.7  13.1 - 13.9 | 4 Hours |
| C++ Stream Input/Outpus: stream I/O classes and objects, stream output, stream manipulators, stream format states, stream error states, unformatted I/O read/write | 15.1 - 15.9 | 3 Hours |
| Templates: function templates, class templates | 14.1 - 14.5 | 1 Hour |
| Exception handling: error-handling techniques, basics of C++ exception handling (try, throw, and catch) | 16.1 - 16.12 | 1 Hour |
| File processing: data hierarchy, files and streams, sequential access files, random access files | 17.1 - 17.11 | 3 Hours |
| Class String: templatized data structures and Standard Template Library: linked lists, stacks, queues, trees, introcution to STL, containers and algorithms (optional), standard C++ language additions (optional) | 18.1 - 18.12 20.1 - 20.7  22.1 - 21.8 | 3 Hours |

Submitted by: Pop

Notes:

* 1 hour = 1 hour of face time
* This outline allows for 3 hours of exams.

Math Department Policy can be found at: https://mtsac.instructure.com/courses/33990/files?preview=1988385