College of Engineering & Information Technology
Department of Computer Science
Programming Principles II – Course Syllabus

Course	Programming Principles II (10671102)
Prerequisites	Programming Principles I (10671101)
Evaluation	25%-30% Homeworks + labs 35% Midterm Exam 40-45% Final Exam
Required Textbook	1. Gaddis: Starting Out with C++: From Control Structures through Objects, 9th edition
Supplement Textbook	2. Malik: C++ programming from problem analysis to program design, D.S. Malik, 8th edition, 2017

Tentative Course Schedule

Week	Topics	Reading & tasks
1	**Pointers – Quick review** • Quick review of memory layout as an array of bytes • The reference operator (getting the address of a variable) • Pointer variable (storing the address) • Null pointer • Dereference operator (*) • Pointer arithmetic • Operator precedence (including * and &) • Arrays and pointers • Pointers comparisons	Gaddis-ch9
2-3	**Pointers** • Void pointer • Const pointers • Dynamic memory allocation of primitive data types • Initializing dynamic memory • Releasing dynamic memory • Dynamically allocating and releasing arrays • Passing parameters by value, reference, and address • Passing 1D array to a function • Const parameter/ using const with pointers	Gaddis-ch9
4-5	**2D array** • Static 2D array • Dynamic 2D arrays • Passing 2D array to a function •	Handsout notes

6	**C-style strings** • c-strings • library functions for c-string • numeric conversion	Gaddis-ch10
7-8	**Structures** • Abstract data type • Accessing struct elements • Initialization • Array of struct • Structure-Aggregation • Passing struct to functions • Returning struct from functions	Gaddis-ch11
9-10	**Object-oriented-programming (1)** • Procedure vs oop • Defining a class • Why Have Private Members? • Class scope • Separating Class Specification from Implementation • Constructors and destructors • Overloading Constructors • Arrays of object	Gaddis-ch13
11-12	**Object-oriented-programming (2)** • Instance and static members • Friendship (friend functions, friend class) • Member-wise assignment • Copy constructor • Operator overloading (Binary+unary) • Aggregation	Gaddis-ch14
13	**CPP streams – text files** • Declaration • Opening a file • Writing to a file • Reading from file • Closing file • Binary files (optional – bonus)	Gaddis-ch12
14+15	**Inheritance** • What Is Inheritance? • Protected access • Constructors and destructors in base and derived classes • Redefining base class members (overriding) • Class Hierarchies(Multi-level inheritance)	Gaddis-ch15
16	• Polymorphism and Virtual Member Functions (optional – bonus) • Abstract Base Classes and Pure Virtual Functions (optional – bonus)	