

# ECE 449 – Object-Oriented Programming and Computer Simulation Spring 2013

**Instructor:** Professor Jia Wang

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**Prerequisites:** CS 116 and (CS 350 or ECE 242). You are REQUIRED to have previous experiences on the following programming topics: branches and loops, sorting and recursion, array and linked list. Experience with digital logic design (e.g. breadboard or Verilog) is a plus for course projects.

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources and make an appointment to speak with me as soon as possible. The Center for Disability Resources is located in the Life Sciences Building, room 218, 312-567-5744 or [disabilities@iit.edu](mailto:disabilities@iit.edu).

**Class Time and Location:** Tue. and Thurs.: 5:00 PM – 6:15 PM, Life Sciences 121

**Class Home Page:** <http://blackboard.iit.edu/>

## Required Textbook:

- “Accelerated C++: Practical Programming by Example”  
A. Koenig and B.E. Moo, Addison-Wesley, 2000. ISBN: 978-0201703535
- Plus additional notes

## Recommended Textbooks:

- “The C++ Programming Language: Special Edition”  
B. Stroustrup, Addison-Wesley, 2000. ISBN: 978-0201700732
- “Design Patterns: Elements of Reusable Object-Oriented Software”  
E. Gamma et al., Addison-Wesley, 1994. ISBN: 978-0201633610

**Course Objective:** To give students a clear understanding of the fundamental concepts of object-oriented design/programming (OOD/OOP) and how they are supported by the standard C++ language. Students will learn the design of complex computer simulation programs using these concepts and software engineering practices.

## Topics Covered:

- C++: containers and algorithms, templates, object semantics, memory management.
- OOD/OOP: class design, inheritance and polymorphism, design patterns.
- Computer simulation: logic simulation, event-driven simulation.

**Grading:** Homeworks 10% / Final Exam: 30% / Projects: 60% / Bonus Project: 30% (Extra).  
A:  $\geq 90\%$  / B:  $\geq 80\%$  / C:  $\geq 60\%$  / D (undergraduate only):  $\geq 55\%$ .

**Homework and Project Policy:** Late homeworks and projects will not be graded. Deadlines will NOT be extended, except for extraordinary reasons. Homeworks will be graded based on general approach and completion, and solutions will be released shortly after due date. Discussions on homeworks/projects are encouraged, but copying will call for disciplinary action.

**Final Exam Policy:** Close book, close note, cheat sheet allowed. Makeup exams will NOT be given, except for extraordinary reasons.

**Lecture Schedule (tentative):**

Date	Topic	Chapters	HW Out	Project Due
1/15, 1/17	Introduction	0		
1/22, 1/24	Files and Strings	1, 2, 3		
1/29, 1/31	Organizing Programs and Data	4	#1	
2/5, 2/7	Containers and Algorithms I	5, 6		
2/12, 2/14	Containers and Algorithms II	7	#2	1: Lexical Analysis
2/19, 2/21	Class Design	9		
2/26, 2/28	Memory Management	10		
3/5, 3/7	Object Composition	11	#3	2: Syntactic Analysis
3/12, 3/14	Logic Simulation	Notes		
3/19, 3/21	<b>Spring Break</b>			
3/26, 3/28	Inheritance and Polymorphism	13	#4	
4/2, 4/4	Design Patterns	Notes		3: Netlist Construction
4/9, 4/11	Event-Driven Simulation	Notes	#5	
4/16, 4/18	Smart Pointers	14		
4/23, 4/25	Templates	8		
4/30, 5/2	Discussions and Review			4: Logic Simulation
5/6 – 5/10	<b>Final Exam</b>		Bonus: The EasyVL Simulator	