

ECE 449 – Object-Oriented Programming and Computer Simulation Spring 2011

Instructor: Professor Jia Wang

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Prerequisites: CS 116 and (CS 350 or ECE 242). Previous experience with programming languages supporting branches and loops is required (e.g. assembly, C, or Matlab). Experience with digital logic (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.

Class Time and Location: Tue. and Thur.: 5:00 PM – 6:15 PM, Wishnick Hall 113

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: $\geq 75\%$ / C: $\geq 60\%$ / D (undergraduate only): $\geq 55\%$.

Homework and Project Policy: Late homeworks and projects will not be graded. Discussions on homeworks/projects are encouraged, but copying will call for disciplinary action.

Final Exam Policy: Makeup exams will NOT be given, except for extraordinary reasons.

Lecture Schedule (tentative):

Date	Topic	Chapters	HW	Project Due
1/11, 1/13	Introduction	0		
1/18, 1/20	Processing Strings	1, 2, 3		
1/25, 1/27	Organizing Programs and Data	4	#1	
2/1, 2/3	Containers and Algorithms I	5, 6		
2/8, 2/10	Containers and Algorithms II	7, 8	#2	1: Lexical Analysis
2/15, 2/17	Class Design	9		
2/22, 2/24	Copy Control and Memory Management	10, 11		
3/1, 3/3	Object Composition	12	#3	2: Syntactic Analysis
3/8, 3/10	Logic Simulation	Notes		
3/15, 3/17	Spring Break			
3/22, 3/24	Inheritance and Polymorphism	13	#4	
3/29, 3/31	Design Patterns	Notes		3: Netlist Construction
4/5, 4/7	Event-Driven Simulation	Notes	#5	
4/12, 4/14	Smart Pointer	14		
4/19, 4/21	Advanced Topics	Notes		
4/26, 4/28	Discussions and Review			4: Logic Simulation
5/2 -5/6	Final Exam			Bonus: The EasyVL Simulator