

SPRING 2019

ESE 501: Digital System Specification and Modeling

Instructor: [Prof. Sangjin Hong](#)
Office: 201 Light Engineering Building
Office Hours: TuTh 1:30 p.m. - 3:30 p.m.
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Lecture Time and Place

TuTh 3:00p.m. - 5:20p.m. in Room 123 Chemistry Building

Prerequisite

ESE 380 and ESE 224 or equivalent. Students are expected to know the logic design, digital circuits, and programming in C or C++. Some background in computer architecture is helpful but not required.

Textbook

System Design with SystemC by Grotket et al, Kluwer Academic Publishers, 2002.
SystemC: Methodologies and Applications by W. Muller et al, Kluwer Academic Publishers, 2003.

Course Goals

A comprehensive introduction to the field of system level design. This course introduces basic concepts of complex hybrid (software/hardware) system modeling and simulation methodologies. Topics include top-down and bottom-up design methodology, system complexity refinement, SystemC specification language syntax and semantics, behavioral and system-level modeling, channel and interface modeling and implementation, and IP core development. Included are three projects on modeling and simulation.

Project

This is a project-oriented course in which you will design three modest-sized systems. No specific lab times are scheduled, and you can work at your convenience.

Course Contents

Week 1: Course Overview, SystemC Basics
Week 2: SystemC Data Types, Modules and Signals
Week 3: Testbenches and Main Program Construction
Week 4: Functional Modeling, Speed Controller Example
Week 5: Modules Parameterization

Week 6: Threads and Events, Watch-Dogs Construction
Week 7: Channel and Interface
Week 8: Channel Implementation
Week 9: Primitive Channel Examples
Week 10: Hierarchical Channel Examples
Week 11: Transaction Level Modeling
Week 12: Refinements
Week 13: Simple Bus Example
Week 14: Advanced Topics

Grading

The grading will be based upon:

- (1) 1 Homework Assignment (10%)
- (2) 3 Projects (50%)
- (3) 2 Midterm Exams (40%)

Blackboard

You can access class information on-line at: <http://blackboard.stonybrook.edu>

For help see: <http://it.stonybrook.edu/services/blackboard>

For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site; you can also call: 631-632-9602 or e-mail: helpme@stonybrook.edu

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