

ESE 356: Digital System Specification and Modeling

Fall 2018

Catalog Description:

A comprehensive introduction to the field of system-on-chip design. Introduces basic concepts of digital system modeling and simulation methodologies. Topics include top-down and bottom-up design methodology, specification language syntax and semantics, RTL, behavioral and system-level modeling, and IP core development. Included are three projects on modeling and simulation.

Course Designation: Elective for Computer Engineering

Text Books: “System Design with SystemC,” Grotker et al. Kluwer Academic Publisher.

Prerequisites: Prerequisite: ESE 380, ESE 224

Coordinator: Sangjin Hong

Goals: Introduce concepts in system specification and modeling.

Course Learning Outcomes:

- ability to apply knowledge of mathematics, science and engineering
- an ability to identify, formulate, and solve engineering problems
- an ability to use techniques, skills, and modern engineering tools necessary for engineering practice

Topics Covered:

Week 1	Course Overview SystemC Basic
Week 2	SystemC Data Types Modules and Signals
Week 3	Test-bench and main program construction
Week 4	Functional Modeling Speed Controller Example
Week 5	Module Parameterization

Week 6	Threads and Events Watch-Dog Constructions
Week 7	Interface Design
Week 8	Channel Implementation
Week 9	Primitive Channel Examples
Week 10	Hierarchical Channel Examples
Week 11	Transaction Level Modeling
Week 12	Simple Bus Example
Week 13	Channel Refinements
Week 14	Communication Refinements

Class/laboratory Schedule: 3 lecture hours per week

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

ADA Statement (Americans with Disabilities Act)

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, 128 ECC Building (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: www.ehs.sunysb.edu and search Fire Safety and Evacuation and Disabilities.

Academic Honesty and Integrity

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at www.stonybrook.edu/uaa/academicjudiciary.

Student Outcomes	% contribution*
<input type="checkbox"/> (a) an ability to apply knowledge of mathematics, science and engineering	40
<input type="checkbox"/> (b1) an ability to design and conduct experiments	
<input type="checkbox"/> (b2) an ability to analyze and interpret data	
<input type="checkbox"/> (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
<input type="checkbox"/> (d) an ability to function on multi-disciplinary teams	
<input type="checkbox"/> (e) an ability to identify, formulate, and solve engineering problems	30
<input type="checkbox"/> (f) an understanding of professional and ethical responsibility	
<input type="checkbox"/> (g) an ability to communicate effectively	
<input type="checkbox"/> (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	10
<input type="checkbox"/> (i) a recognition of the need for, and an ability to engage in life-long learning	
<input type="checkbox"/> (j) a knowledge of contemporary issues	
<input type="checkbox"/> (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	20
<input type="checkbox"/> Any other outcomes and assessments?	

Document Prepared by: Sangjin Hong

Date: April 4, 2018