

Syllabus

1. Course Staff and Office Hours

Instructor: Sangjin Hong
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Light Engineering Building 201

Office Hours: Tuesday and Thursday, 10:00am to 12:00pm
Other hours by appointment

Instruction Location: 154 Light Engineering Building

Instruction Delivery: Hybrid Mode. In class face-to-face instruction is planned.
The lecture will be recorded using Zoom. After the lecture, the recorded lecture will be posted on Blackboard

TAs: To be announced

Office hours and locations may change. Please check Blackboard for most up-to-date information.

2. Course 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.
Fall.

Prerequisites: ESE 280, ESE 224

Credits: 3

3. Textbook

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

4. Course Learning Objectives

Upon completion of the course, students will have

- 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.

5. Student Learning Outcomes

Student Outcomes	% contribution
1 an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	40%
2 an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	10%
3 an ability to communicate effectively with a range of audiences.	10
4 an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
5 an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	10%
6 an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.	30%
7 an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	

6. Topics Covered

Week 1	Course Overview SystemC Basic, Modules, Data Types
Week 2	Processes in SystemC, Time in SystemC Use of Macros, Test-bench, Tracing, Debugging
Week 3	Model of Computation Hardware Modeling
Week 4	Functional Modeling Speed Controller Example
Week 5	Dynamic Processes Watch Dog and Event Usages
Week 6	Basic Channels, Robot Modeling Interface Design and Ports
Week 7	Primitive Channels and Evaluate-Update Channels Hierarchical Channels
Week 8	Custom Channels and Data Mutex, Semaphore, FIFO

Week 9	Programmable Structures More on Parameterization
Week 10	OSCI TLM Introduction
Week 11	HW-HW Refinements HW-SW Refinements
Week 12	Channel Refinement Communication Refinements
Week 13	Simple Bus Example and More on TLM
Week 14	More on Communication Refinements Channel Refinements

7. Assignments

7.1. Homework Assignments

Homework Assignments will be issued roughly weekly. A full schedule is available on Blackboard. (This schedule will be updated as needed.) All assignments will be due at the *beginning* of class on the assigned day. Please see the Late Homework Policy, below.

All homework assignments must be turned in on paper. Writing or typing your solutions electronically is great, but you must print them out and submit the paper copy.

7.2. Late Homework Policy

Each student is given two “late days” for homework assignments. Each late day can be used to turn in one homework assignment one day late. You may not use both late days on one assignment. **Late days may not be used on labs.**

7.3. Collaboration Policy

Homework assignments are to be completed individually. You may *discuss* them with your classmates. (In fact, you are encouraged to do so.) However, you must write up your own solution individually without any help from any other person.

For example, it is fine if you and a friend discuss a problem together, and then separately work out the details and write your own separate solutions. On the other hand, it is not acceptable to share written solutions with another person or to create the written solutions together. In other words, the work you turn in must entirely be your own personal effort.

If you discuss homework problems with another person in the class, you must write “I discussed this assignment with...” and include the name(s) at the top of the assignment.

8. Grading

Your grade will be based on labs, homework assignments, two midterm examinations, and one final examination.

Homework Assignments	10%
Projects	50%
Midterms	40%

9. Academic Honesty

Any academic dishonesty on a written homework will result in a zero grade for the assignment for all parties involved.

All exam work must be entirely your own with no collaboration or outside materials/information. Any academic dishonesty on the midterm exams or the final exam will result in failing the course. The case will be submitted to the College of Engineering's Committee on Academic Standing and Appeals.

10. Electronic Communication Statement

Email and especially email sent via Blackboard (<http://blackboard.stonybrook.edu>) is one of the ways the faculty officially communicates with you for this course. It is your responsibility to make sure that you read your email in your official University email account. For most students that is Google Apps for Education (<http://www.stonybrook.edu/mycloud>), but you may verify your official Electronic Post Office (EPO) address at <http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo>.

If you choose to forward your official University email to another off-campus account, faculty are not responsible for any undeliverable messages to your alternative personal accounts. You can set up Google Mail forwarding using these DoIT-provided instructions found at <http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail>.

If you need technical assistance, please contact Client Support at (631) 632-9800 or supportteam@stonybrook.edu.

11. Student Accessibility Support Statement

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

12. Academic Integrity Statement

Each student must pursue their academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary.

Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

13. Critical Incident Management Statement

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.