

# ECE 5397

## Hardware Verification

### Fall 2021

**Class Number:** ECE5397 - 27259  
**Time:** Tues/Thurs 8:30-10:00 AM  
**Room:** CBB 106  
**Instructor:** Dr. Hung "Harry" Le  
**Office:** N313  
**Phone:** 713-743-6166  
**Email:** [hgle5@uh.edu](mailto:hgle5@uh.edu)  
**Office Hours:** TBA or call/email for appointment

#### Catalog Description:

ECE 5397: Hardware Verification Cr. 3. Prerequisite: Having programming experience or Instructor's permission. Hardware Verification including FPGA, ASIC and System Verification using SystemVerilog, a superset of the hardware description language Verilog. Programming Techniques and interfacing. Introducing to UVM.

ECE 6397: Hardware Verification Cr. 3

#### Course Topics:

- Data Types
- Procedure
- Testbench,
- OOP
- Randomization
- Threads
- Advanced OOP and Testbench
- Functional Coverage
- Advanced Interfaces
- UVM

#### Expected Course Outcomes:

Students who successfully complete this course are expected to meet the following course outcomes.

1. Students will be able to create testbenches for various systems or FPGA/ASIC design. (ABET outcomes a, b, c, f, j)
2. Students will be able to perform functional coverage of a FPGA or ASIC design. (ABET outcome a, b c, e. f)
3. Students will be able to randomize stimuli (ABET outcome b).
4. Students will be able to create advanced interfaces. (ABET outcome a, b, d)

**Textbooks:**

*Required:* Spear, C. and Tumbush, G. *SystemVerilog for Verification: A Guide to Learning the Testbench Language Features, 3<sup>rd</sup> Edition*, Springer, 2012. ISBN 978-1-4614-0714-0. e-ISBN 978-1-4614-0715-7  
DOI 10.1007/978-1-4614-0715-7.

**Laboratory Project:** A Final Project is to be announced.

**Attendance and In-Class Work:** Attendance at every class is expected. Reading the assignments in advance and coming to class prepared is expected. Each student will be assigned a course/laboratory topic to research, and then present to the class.

**Exams:** a midterm exam and a final team project.

**Missed Exams:** If you miss taking an exam, you will receive a zero on the exam unless you do the following:

1. Immediately - as soon as possible, but no later than 48 hours after the scheduled exam - notify your instructor.
2. As soon as possible, take to your instructor a written explanation, doctor's note, or other documentation describing the unavoidable emergency beyond your control that prevented you from taking the exam.

**Grading:** The course grade will be based on the following approximate weightings (factors during the semester may change these percentages):

- |                               |         |
|-------------------------------|---------|
| • Final Project or Final Exam | ~30-50% |
| • Midterm Exam                | ~20-50% |
| • Quizzes                     | ~30-40% |
| • Homework                    | ~5-15%  |
| • Attendance                  | ~3-8%   |

Letter grade cutoff points will be approximately: A 90; B 80; C 70; C- 65

**Course Web Site:** This course utilizes only one web sites:

- The Blackboard Learn system: <https://elearning.uh.edu/>

It is recommended that you consult these sites often for material related to this course. Among the documents that are available are the latest version of the class schedule, copies of assignments, copies of some class handouts, and many other project-related documents.

**Religious Holy Days:**

Students whose religious beliefs prohibit class attendance on designated dates or attendance at scheduled exams may request an excused absence. To do this, you are strongly encouraged to request the excused absence, in writing, by Wednesday, September 8th, 2021. Please submit this written request to your instructor to allow the instructor to make appropriate arrangements. For more information, see the Student Handbook\*.

**Students with Disabilities:**

Students with recognized disabilities will be provided reasonable accommodations, appropriate to the course, upon documentation of the disability with a Student Accommodation Form from the Center for Students With Disabilities. To receive these accommodations, you must request the specific accommodations, by submitting them to the instructor in writing, by Wednesday, September 8th, 2021. Students who fail to submit a written request may not be considered for accommodations. For more information, see the Student Handbook\*.

**Withdrawal Policy:**

You may drop the course without receiving a grade until 11:59 pm Wednesday, September 8th, 2021, which is the University's last day to drop without record. After this date and until 5pm, Tuesday, November 4th, 2021, you may drop with a W if you have not exceeded your total W limit. Do not assume that you will be dropped by the instructor if you stop attending class. You are responsible for completing the withdrawal procedure. Detailed information about these issues is available in the Student Handbook\*.

**Academic Honesty Policy:**

Students in this course are expected to follow the Undergraduate Academic Honesty Policy of the University of Houston, as described in the Undergraduate Catalog. It is your responsibility to know and follow this policy. You must sign the Academic Honesty Statement on the last page of this handout, detach it, and submit it by Wednesday, September 8th, 2021. If you fail to do this, you may be dropped from the course.

**Counseling and Psychological Services (CAPS)** can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS ([www.uh.edu/caps](http://www.uh.edu/caps)) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. Also, there is no appointment necessary for the "Let's Talk" program, which is a drop-in consultation service at convenient locations and hours around campus.

**ECE 5397/6397 Project Policy on Academic Honesty:**

For project assignments, the project team members must work together, and they must NOT work closely with other students. Your team must design, write, test, and debug the program alone. Discussions with other students must be limited to understanding concepts taught in the class, or understanding how the processor and lab equipment work, i.e., general stuff, not stuff specific to this lab. Similarly, **using any part of a project solution from a previous semester is not allowed**. Failures to observe this policy will be pursued as academic honesty violations.

Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional

and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

### Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the [Center for Students with DisABILITIES](#). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

### Syllabus Changes

Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through (*specify how students will be notified of changes*).

### Resources for Online Learning

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our [Power-On](#) website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, and Blackboard; requesting a laptop through the Laptop Loaner Program; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact [UHOnline@uh.edu](mailto:UHOnline@uh.edu).

### UH Email

Email communications related to this course will be sent to your [Exchange email account](#) which each University of Houston student receives. The Exchange mail server can be accessed via Outlook, which provides a single location for organizing and managing day-to-day information, from email and calendars to contacts and task lists. Exchange email accounts can be accessed by logging into Office 365 with your Cougarnet credentials or through Access UH. They can also be configured on [IOS](#) and [Android](#) mobile devices. Additional assistance can be found at the [Get Help](#) page.

## Webcams

Access to a webcam is required for students participating remotely in this course. Webcams must be turned on during exams to ensure the academic integrity of exam administration.

## Honor Code Statement

Students may be asked to sign an honor code statement as part of their submission of any graded work including but not limited to projects, quizzes, and exams: *"I understand and agree to abide by the provisions in the (select: [University of Houston Undergraduate Academic Honesty Policy](#), [University of Houston Graduate Academic Honesty Policy](#)). I understand that academic honesty is taken very seriously and, in the cases of violations, penalties may include suspension or expulsion from the University of Houston."*

**Synchronous Online Courses:** This course is being offered in the Synchronous Online format. Synchronous online class meetings will take place according to the class schedule. There is no face-to-face component to this course. In between synchronous class meetings, there may also be asynchronous activities to complete (e.g., discussion forums and assignments). This course will have a final exam per the [University schedule](#). The exam will be delivered in the synchronous online format, and the specified date and time will be announced during the course. Prior to the exam, descriptive information, such as the number and types of exam questions, resources and collaborations that are allowed and disallowed in the process of completing the exam, and procedures to follow if connectivity or other resource obstacles are encountered during the exam period, may be provided.

## **Helpful Information**

**COVID-19 Updates:** <https://uh.edu/covid-19/>

**Coogs Care:** <https://www.uh.edu/dsaes/coogscare/>

**Laptop Checkout Requests:** <https://www.uh.edu/infotech/about/planning/off-campus/index.php#do-you-need-a-laptop>

**Health FAQs:** <https://uh.edu/covid-19/faq/health-wellness-prevention-faqs/>

**Student Health Center:** <https://uh.edu/class/english/lcc/current-students/student-health-center/index.php>

# Academic Honesty Statement

I have read the University of Houston Undergraduate/Graduate Academic Honesty Policy found in <http://publications.uh.edu>. I agree to abide by the provisions of this policy. I also understand that I have met all the required prerequisites of this course or I have obtained a signed waiver of the prerequisites.

In particular, I understand that for all laboratory assignments in this course, the team members must work together, and must not work closely with other students. Our team must design, write, build, test, and debug the programs/circuits alone. Discussions with other students must be limited to understanding concepts taught in the class, or understanding how the processor and lab equipment work, i.e., general stuff, not solutions to this lab. I understand further that using any part of a lab solution from a previous semester is not allowed. Failures to observe this policy will be considered academic honesty violations.

Name/PSID: (Please print)

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Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Please complete this page, and submit it to the instructor by Wednesday, September 8th, 2021. If you fail to do this, you may be dropped from the course (ECE5397/6397).