# Syllabus

Help

This course will give an introduction to most of the important topics related to hardware security. The course is designed for those who have learning readiness and maturity similar to a junior college student majored in science or engineer. No specific background is absolutely required. However, basic skills in programming, digital logic design, and computer organization are highly recommended.

Upon completing the course, we expect **all our students** to understand the vulnerabilities in current digital system design flow and the physical attacks to these systems; to learn that security starts from hardware design and to be aware of the tools and skills available for building secure and trusted hardware.

Finally, for **hardware designers** or students with solid hardware design background, we believe that top security priority should be given to the followings: (1) how to secure your design intellectual properties from piracy, (2) how to secure the computation and data or design trusted systems, and (3) how to build hardware security primitives to enhance system security. Although we cannot cover the necessary depth and all the technical details of the existing solutions, we hope that you will find this course helpful in solving these challenges.

## GRADING

The final grade for the course will be based on weekly quizzes (6 quizzes, 90 points total) and a final exam (30 points total). To pass the class, you must achieve a combined score of 80 (66%) or higher; to pass with distinction, you must achieve 100 (83%) or higher.

- **Quizzes (90 points, 75%):** a quiz will be available on each Monday and you will have 10 days to complete it after that week's lecture is over. For each quiz, you can make up to 4 submissions and the highest score of all the submissions will be used as the effective score for that quiz. As we will discuss different topics each week, you are highly recommended to complete the quizzes as soon as possible. There will be a 20% penalty per day for late submissions. You will receive no credit if you submit 5

days after the deadline. Each student will have a total of 10 days as late days.

- **Final Exam (30 points, 25%):** the final exam questions will be released at the end of week 6 when all the lectures are completed. You will have 3 weeks to complete the final. However, be aware that the final exam overlaps with the last quiz. Please plan your time and efforts accordingly. *Late submission of the final exam will not be graded*.

The following is the tentative topics for each week and the due dates of the quizzes and the final exam.

## WEEKLY TOPICS and SCHEDULE

**1. Digital System Design: Basics and Vulnerabilities**
*Jan. 5 - Jan. 11, Quiz due Jan. 20, 2015.*
**2. Intellectual Property Protection**.
*Jan. 12 - Jan. 18, Quiz due Jan. 27, 2015.*
**3. Physical Attacks and Modular Exponentiation**
*Jan. 19 - Jan. 25, Quiz due Feb. 3, 2015.*
**4. Side Channel Attacks**
*Jan. 26 - Feb. 1, Quiz due Feb. 10, 2015.*
**5. Hardware Trojan and Physical Unclonable Functions**
*Feb. 2 - Feb. 8, Quiz due Feb. 17, 2015.*
**6. Emerging Hardware Security Topics**
*Feb. 9 - Feb. 15, Quiz due Feb. 24, 2015.*
***Final Exam**, released on Feb. 15, 2015, due Mar. 8, 2015.*

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