
ECE 8930
Introduction to Blockchain Technology

Class Location/Time	Tues., Thurs., 5:00 – 6:50 p.m.
Instructor	Lu Yu (luy@g.clemson.edu), 300b Riggs Hall
Office Hours	TBD. Other times by appointment .
Grader	TBD
Prerequisites	None
Important Dates	<ul style="list-style-type: none">• May. 13, Wed – Last day to drop a class or withdraw from the University without a W grade.• Mar. 18, Mon – Last day to drop a class or withdraw from the University without final grades.

Welcome to Introduction to Blockchain Technology!

My desire is that everyone succeed in this course to as great an extent as possible; furthermore, my desire is that you succeed not only in this course but in applying what you learn throughout your careers. For this reason, we will cover a lot of material, but many of the procedures of the course have been designed to help you master the material. If you come to all the classes, do all the homework, complete all the projects, and ask questions when needed, you should be able to do well in this course. I commit to treating you fairly and with respect and doing all that I can to help you succeed.

For questions about administrative procedures or other questions not related to course content, the best way to contact me is by email.

Course Objectives

Upon completion of this course, you should have a comprehensive and clear understanding of the mechanics of blockchain technology including the following: cryptography fundamentals, data structure of blockchain, consensus algorithms, potential attacks against distributed applications and smart contract.

Required Materials

Course notes, homework assignments and other materials are available for download on Canvas via <http://www.clemson.edu/canvas>. No specific textbooks are required for this course.

Topical Outline

1. Overview
 - 1.1. The promises of the blockchain technology
 - 1.2. trustful vs. trustless
2. Data structure of blockchain
 - 2.1. The chain of blocks
 - 2.2. Data structure of Bitcoin
 - 2.3. Data structure of Ethereum
3. Consensus algorithms
 - 3.1. Proof-of-Work (PoW)
 - 3.2. Proof-of-Stake (PoS)
 - 3.3. Lightweight mining (LWM)
 - 3.4. Random walk (IoTA)
4. Privacy cryptocurrency
 - 4.1. Monero
 - 4.2. DASH
 - 4.3. ZCash
5. Smart contract*

Grading

Final grades will be based on the following weights:

- 30% homework
- 45% for two projects
- 20% final exam.

A – 90% - 100%; B – 80 to < 90%; C – 70 to < 80%; D – 60 to < 70 & F – < 60%

Additional Policies

Homework: All problem sets are due at the time and date specified on the assignment. **No** late assignments will be accepted, and they are due at the time class begins. Because you have access to the solutions. The purpose of the HW is to prepare you for the tests and final exam. I STRONGLY recommend you accomplish all the problems on your own first before looking at the solutions.

Examinations: No make-up exams will be given unless an acceptable reason is presented to the instructor **at least** one week before the examination date. We shall have three in-class tests, and a comprehensive final exam. Paper materials and references are allowed.

Disputing Grades: A student wishing to dispute a grade on a test must do so by emailing the grader within 24 hours after the instructor hands out the test in class. Appeals made after this deadline will **NOT** be considered. If the dispute cannot be resolved between the student and the grader, the student may bring the dispute to the instructor.

Attendance: **Three** in-class check-ins will be done throughout the semester, each of which accounts for one point in the final grade.

Laptops and **cellphones** are not allowed in class.

Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a 'high seminary of learning.' Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. In instances where academic standards may have been compromised, Clemson University has a responsibility to respond appropriately to charges of violations of academic integrity.

Further information on Academic Integrity can be found in the [Undergraduate Announcements](#) and in the [Graduate School Policy Handbook](#).

Access Accommodations

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here: <https://www.clemson.edu/academics/studentaccess/index.html>.

Anti-Harassment and Non-Discrimination

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Executive Director of Equity Compliance. Her office is located at 110 Holtzendorff Hall, 864.656.3181 (voice) or 864.656.0899 (TDD).

Emergency Procedures

Emergency procedures have been posted in all buildings and on all elevators. Students should review these procedures for their own safety. Students are required to monitor their university email (see <https://www.clemson.edu/studentaffairs/student-handbook/universitypolicies/email-communications.html>) thus establishing this as a convenient method for official communication to students. Students are also encouraged to enroll in CU-Safe alerts. See <https://www.clemson.edu/cusafety> for more information.

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