

Standardized Syllabus for the College of Engineering

CIS 6930 – Blockchain: Optimization and Applications

1. Catalog Description:

Blockchain has emerged as one of the world's most trusted and decentralized systems, which will have an immense global impact similar to the way Internet did in the mid-'90's. The potential applications of Blockchain technologies span across a variety of different environments, from cryptocurrencies, such as Bitcoin and Ethereum, to other infrastructures and application domains such as the Internet-of-Things, Online Social Networks, and Digital Health. The objective of this course is to discuss the fundamental and recent advances of Blockchain, especially focusing on the Scalability, Optimization aspect, and its Emerging Applications.

2. Pre-requisite:

There is no formal prerequisite for this course. Students are expected to be very self-motivated and able to keep up with the reading and presentation assignments. Students should have written/published at least one research article before.

3. Course Objectives

Topics discussed in this course include the following:

- Introduction on Blockchain
- Attack Surface Analysis
- Scalability: Sharding, Lightning, State Channels
- Optimization on Blockchain
- Applications: FinTech, DeFi, IoT, and OSNs

4. Instructor: Prof. My T. Thai

- E-mail address: mythai@cise.ufl.edu
- Website: <http://www.cise.ufl.edu/~mythai/>
- Office hours: W noon-1:40pm via zoom:
<https://ufl.zoom.us/j/98096425509?pwd=Q0JDaXpJalRESGp0aGJzNlZmOWJzQT09>

5. Teaching Assistant:

- Name: Ruiliang Gao
- Office hours: T 1-3pm via <https://ufl.zoom.us/j/6414387431>

6. Meeting Times and Locations:

- Tuesday: Period 2-3 (8:30am – 10:25 am). LAR0310
- Thursday: Period 3 (9:35am – 10:25 am). LIT0113

7. Textbooks and Software Required: N/A

Lecture notes and list of references shall be provided.

8. Recommended Reading

- Bitcoin and Cryptocurrency Technologies. Narayanan et. al.
- Free introductory book available [here](#).

9. Course Outline: (subject to change)

- Each topic will be covered within 3 weeks, in the order listed in the topics section.

10. Attendance and Expectations: Attendance is not required, however, it is your problem if you missed any material.

11. Grading:

- Paper Presentation (10%):
 - Each team will study a number of research papers assigned by the Instructor
 - Prepare and make a presentation and lead classroom discussion
- Homework Assignments (30%):
 - 2 homework assignments
 - HW1: Feb 3rd (Out). Feb 10th (Due)
 - HW2: March 31st (Out). April 7th (Due)
 - Due at the beginning of the lecture on the due date
 - No late assignment will be accepted
- Midterm Exam (20%). March 17th
- Group Project (40%):
 - We will have 3 milestones for this group project. The first one is to submit the "project proposal", weighs 5%. The second one is the midterm project report, weighs 5%. And the last one is the final project report, weighs 30%
 - By the second week, students will be formed into a number of "research groups." Each group may consist of 2 or 3 students.
 - The "research topics" will be chosen in consultation with the instructor.
 - A project may consist of:
 - Performing some experiments to verify and compare existing ideas/approaches. These experiments must reveal some critical analysis and insights of each approach.
 - Providing in-depth analysis
 - Proposing original ideas/conducting original work to improve the existing ideas or approaches
 - The project must be done by following this procedure:
 - By the third week, each group selects one or two research topics in consultation with the instructor.
 - By Feb 3rd, a "research proposal" must be submitted which describes the scope of the project, lists the issues to be addressed, and outlines approaches to be taken. Several recommended papers

related to the project must also be provided. The research proposal is about 4 pages long, single space.

- By March 3rd, the midterm report in the format of an ACM/IEEE journal paper is due.
- By April 25th, the final project report in the format of a journal paper is due. It is 10 pages minimum. Each group will also do a presentation on their final project during the last week of the class, April 12, 14, 19, depending on how many groups we will have.

12. Grading Scale:

- A \geq 90%, 90% > A- \geq 87%, 87% > B+ \geq 85%, 85% > B \geq 80%, 80% > B- \geq 77%, 77% > C+ \geq 75%, 75% > C \geq 70%

“Undergraduate students, in order to graduate, must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement.

Graduate students, in order to graduate, must have an overall GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

13. Make-up Exam Policy: Through arrangement with the instructor. Must have a written letter justifying the reason for not taking the exam during the regularly scheduled time.
14. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.
15. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.
16. UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
 - UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
 - Career Resource Center, Reitz Union, 392-1601, career and job search services.
17. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do

so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.