Standardized Syllabus for the College of Engineering

CIS 6930 – Fundamentals in Blockchain
Spring 2025

1. Catalog Description:

Blockchain has emerged as one of the world's most trusted and decentralized systems, with the potential to create a global impact akin to that of the Internet in the mid-1990s. The applications of Blockchain technology extend across diverse domains, ranging from cryptocurrencies like Bitcoin and Ethereum to infrastructure and application areas such as the Internet of Things (IoT), supply chain management, and digital health. This course aims to explore the fundamentals and recent advancements in Blockchain technology, with a particular focus on its security, scalability, and emerging applications in artificial intelligence (AI).

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.

3. Course Objectives

Topics discussed in this course include the following:

- Introduction on Blockchain
- Attack Vector Analysis
- Scalability: Sharding, Lightning, State Channels
- Applications: FinTech, IoT, Machine Learning

4. Instructor: My T. Thai
   - Office location: MH 4050C
   - E-mail address: mythai@cise.ufl.edu
   - Website: http://www.cise.ufl.edu/~mythai/
   - Office hours: W noon-1:40pm

5. Meeting Times: T 2-3 (8:30 - 10:25) and Th 3 (9:35-10:25) at CSE121

6. Textbooks and Software Required: N/A

Lecture notes and list of references shall be provided on the canvas

7. Recommended Reading
   - Bitcoin and Cryptocurrency Technologies. Narayannan et. al.
   - Free introductory book available here.
   - Handbook of Blockchain. Tran et. al.

8. Course Outline: (subject to change)
    - Each topic will be covered within 3 weeks, in the order listed in the topics section.
9. Attendance and Expectations: Attendance is strongly recommended.

10. Grading:
    - Paper Presentation (15%):
        - Each student will study in-depth a research paper assigned by the instructor
        - Prepare and make a presentation and lead classroom discussion
    - Homework Assignments (30%):
        - 2 homework assignments
            - HW1: Feb 11th (Out). Feb 18th (Due)
            - HW2: April 1st (Out). April 8th (Due)
        - Due at the **beginning** of the lecture on the due date
        - **No late** assignment will be accepted
    - Midterm Exam (15%)
        - March 26th, 2025
    - 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 15%. And the last one is the final project report, weighs 20%
        - By the second week, students will be formed into several "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. Detail of due date will be given in the Schedule page:
            - By the third week (Jan 28-30), each group selects a research topic in consultation with the instructor.
            - By Feb 6th, 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 Mar 13th, 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 17th and 23rd, depending on how many groups we will have.

11. Grading Scale:
    - A >= 90%, 90% > A- >= 87%, 87 %> B+ >= 85%, 85% > B >= 80%, 80% > B- >= 77%, 77% > C+ >= 75%, 75% > C >= 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

12. 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.

13. 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.

14. 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.

15. 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.

16. 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.