

EGR 8491: Blockchain Technology and Uses

Class Meetings

Section 001 and DL1: Thursdays, 6:10pm – 8:50pm

Instructor

Professor Hasshi Sudler

Adjunct Professor (office through ECE)

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Office Hours

Office hours are available by appointment. Please contact the instructor to arrange a meeting time.

Course Objectives

To provide both a technical understanding of how the blockchain (distributed ledger technology) works and case studies of how blockchain technology is being applied in a variety of industries related to asset management, payments, public records and supply chain management.

The course addresses questions currently under research such as why and when to use blockchains, impacts on trust assumptions, how blockchains impact societies and economies, and what technical limitations currently exist in the evolution of blockchain technology.

Grading Policy

Your final grade will be determined from the following:

- Assignments: 30% of grade
- Midterm: 30% of grade
- Semester Design Project: 35% of grade
- Participation: 5% of grade

The scale used to assign letter grades is:

| Numerical Grade | Letter Grade |
|-----------------|--------------|
| A | 94 to 100 |
| A- | 90 to 93 |
| B+ | 87 to 89 |
| B | 83 to 86 |
| B- | 80 to 82 |

Attendance

Class and laboratory attendance for first-year students is mandatory. A first-year student will receive a grade of "Y" (failure) whenever the number of unexcused absences in a course exceeds twice the number of weekly class meetings for the course.

State here if attendance is mandatory or not for your class. Provide a description of what it means to be present (seated and ready to go, just in the room, camera on if virtual, be explicit).

Where possible, students should inform their instructors if they plan to be late or absent from class. In all cases, students should be prepared to provide documentation to petition for *excused* absences to the Associate Dean for Student and Strategic Programs, Dr. Stephen Jones. Students should use the [form for requesting an excused absence](#). Excused absences do not count toward a failure in the course for first year students. Absence from class does not release the student from work assigned. Students who miss an in-class obligation (exam, presentation, etc.) due to an excused absence will not be penalized - the instructor may offer a make-up test, arrange an alternative time for a presentation, exempt a student from the assignment, or provide another arrangement. In the case of illness or injury, the form must be submitted within 24 hours of missing class.

The University's list of excused absences for all students includes the following:

- participation in NCAA athletic competitions
- participation in special academic events (e.g., conferences, field trips, project competitions)
- participation in official university business (e.g., student representatives attending meetings related to university governance)
- attendance at significant events involving the immediate family (e.g., funerals, weddings)
- religious holidays - see the University's policy on Religious Holidays
- college-approved participation in placement activities (e.g., job interviews, graduate school interviews, attending job fairs)
- legally required absence (jury duty, court appearance, short-term military service)
- documented serious illness, such as COVID, or disability

Commented [AW1]: Include this statement if you are teaching freshmen

Commented [AW2]: Be sure to include a statement here about attendance

Commented [AW3]: Mandatory

Course Materials

The course will require you to either download or access web tools for ethical hacking exercises.

Readings will be provided and should be read prior to class discussions.

Academic Integrity

The College of Engineering is committed to creating an environment of academic integrity and ethical decision-making that we hope is reflected in the actions of our students and graduates. As Villanova students, integrity is central to the University mission. As engineers, our code of conduct requires us to place honor and integrity at the forefront of everything we do. As engineering students, it is expected that you will begin to adopt these values and instill them into your work habits. Students violating the academic integrity policy will receive a zero on that assignment or exam and the violation will be reported to the Associate Dean for Academic Affairs.

Students are encouraged to read the [University's academic integrity policy](#).

The College of Engineering has adopted the following exam guidelines:

- Students must arrive before the start of the exam. Under exceptional circumstances a student may need to arrive late, but he/she can enter the exam no later than 5 minutes after the start of the exam.
- All cell phones must be turned off and stored away until the student exits the exam room.
- The official Villanova class attendance policy must be followed when requesting excuses for absences or lateness to an exam.
- Each student must write and sign the following statement, *"I have neither given nor received any unauthorized assistance in the completion of this exam."* If taking an exam remotely, students still need to copy and sign this statement (even if signed for electronically).
- In the case of virtual exams, the instructor may implement video proctoring or other measures to ensure academic integrity. For consent purposes, the instructor will announce ahead of time to students if they plan to use any form of video proctoring during an assessment and whether a recording will take place.

Commented [AW4]: Mandatory section

Commented [AW5]: You may have a more stringent penalty, but this is typically what profs in CoE do

Commented [AW6]: Only needed if you have exams

Adherence to the Student Code of Conduct and the CARITAS Commitment

Students are expected to act in a professional and respectful manner to their fellow students, faculty, and staff. Students should become acquainted with and understand the responsibilities set forth in the Student Handbook, especially those in the sections on Policy and Regulations. Adherence to University regulations is expected and required for successful completion of the program of studies. Enforcement within the classroom of policies regarding classroom behavior is the responsibility of the faculty member. All other discipline problems are to be referred to the Dean of Students.

Commented [AW7]: Mandatory

Students, faculty, and staff are expected to comply with the [CARITAS Commitment](#). Students should wear masks, practice social distancing and good hygiene, wipe down their work area upon arrival and departure, and request an excused absence if they are not feeling well.

Commented [AW8]: Mandatory for hybrid classes, not required for online only classes

Online Expectations

To foster a professional environment, please wear appropriate clothes, mute if you are not talking to cut down on background noise, refrain from eating, and select an appropriate setting when we are meeting online.

Commented [AW9]: Optional feel free to edit to your own style and expectations. Also, do you expect students to be in attendance or can they watch later? If they want to watch later, do they need to alert you?

Students with Disabilities

It is the policy of Villanova to make reasonable academic accommodations for qualified individuals with disabilities. If you are a person with a disability please contact me after class or during office hours to make arrangements.

If you have a non-physical disability you need to register with the Learning Support Office by contacting 610-519-5176 or at learning.support.services@villanova.edu as soon as possible. Registration is needed to receive accommodations.

The Office of Disability Services collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The ODS provides Villanova University students with physical disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact and register with Gregory Hannah, advisor to students with disabilities @ 610-519-3209 or visit the office on the second floor of the Connelly Center.

Commented [AW10]: Mandatory wording

Electronics Policy

Online portions of this class may be recorded so that students that are absent may view the content later.

The use of electronic devices, such as phones, laptops, tablets, etc., during class is...

Students are prohibited from making any audio or visual recordings (including taking photographs) of lectures, discussions, or other classroom activities, unless a student (1) has written permission in advance from the instructor, or (2) is permitted to record under terms and conditions as approved by the University's Office of Disability Services or Learning Support Services. Students who have received approval to record classes as an academic accommodation must provide supporting documentation from the Office of Disability Services or Learning Support Services in advance of any recording. Students may use authorized recordings only for the purposes of individual study in the course and may not disseminate or share them with a wider audience without explicit permission.

Commented [AW11]: Mandatory section

Commented [AW12]: You need to make material available to students that cannot attend due to illness or accommodations. Recording the class may be easiest, but it is not the only way. If you are planning to record, you should state this up front.

Commented [AW13]: ...[Instructor fills in their policy]. (Internal note: The instructor's policy should ideally address their general stance on recording of class sessions and the circumstances under which recording will be allowed or prohibited. If an instructor generally prohibits recording, yet allows recording of certain classes for some reason, they should notify all students that those classes will be recorded. If recording is permitted as an ADA accommodation for a student, instructors obviously should not identify the student(s).)

Copyright Policy

The materials used in Villanova University courses ("Course Materials") generally represent the intellectual property of course instructors, third parties and/or the University which may not be disseminated or reproduced in any form for public distribution (e.g., sale, exchange, etc.) without the written permission of the course instructor. Course Materials include all written or electronic documents and materials, including syllabi, current and past examination questions/answers, and presentations such as lectures, videos,

Commented [AW14]: Mandatory section

PowerPoints, etc., provided by a course instructor. Course Materials may only be used by students enrolled in the course for academic (course-related) purposes.

Published course readings (book chapters, articles, reports, etc.) available in Blackboard are copyrighted material. These works are made available to students through licensed databases or fair use. They are protected by copyright law, and may not be further disseminated or reproduced in any form for distribution (e.g., uploading to websites, sale, exchange, etc.) without permission of the copyright owner.

Follow these links for more information about [intellectual property](#), [copyright](#), and [computer acceptable use](#).

The Learner's Studio

Villanova's Learners' Studio provides free content tutoring for over 100 courses (excludes writing, math, and entry level VSB courses). From quick homework clarification questions to prep for final exams, we can help! Our peer tutors are each endorsed by two faculty members and are trained according to CRLA national standards. All tutoring services at the university can be found [here](#). Don't see the class you want listed? Click [here](#). For more information, contact juliana.studer@villanova.edu or call 610-519-5862.

The Center for Speaking and Presentation

Villanova's Center for Speaking and Presentation provides expert guidance on topics including organizing presentation material, performing as a cohesive group, voice modulation, vocal interruptions, speaking anxiety and more! All tutoring services at the university can be found [here](#). For more information, contact juliana.studer@villanova.edu or call 610-519-5862.

Commented [AW15]: If you have presentations

Schedule

| Date | Descriptions | P-Set/Exam |
|--------|---|----------------|
| 28-Jan | Introduction to Blockchain and the blockchain evolution | |
| 4-Feb | The mining process, difficulty algorithm | PS1 |
| 11-Feb | Review of Blockchain architecture; Analyzing the Bitcoin Blockchain | |
| 18-Feb | Consensus Protocols; Introduction to the Ethereum project | PS2 |
| 25-Feb | 51% Attacks and modeling Blockchain risk; Mining the Blockchain | |
| 4-Mar | Hyperledger Fabric; R3 Corda Blockchain (midterm review) | |
| 11-Mar | Introduction to smart contracts | |
| 18-Mar | MIDTERM | Midterm |
| 25-Mar | Sending transactions over the blockchain | |
| 1-Apr | Building Distributed Apps | PS3 |
| 8-Apr | Building Hybrid DApps | |
| 15-Apr | Applications in Asset Management and Payments | Draft Paper |
| 22-Apr | Applications in Public Records and Supply Chain Management | |
| 29-Apr | SEMESTER DESIGN PRESENTATION | Design Project |

Course Management

Distance Learners:

Due to COVID-19, all class sessions will be held remotely.

