CMPSC 390
Cryptocurrency Engineering and Applications
Spring 2021, Module 1
Syllabus

Course Instructor
Dr. Janyl Jumadinova
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Website: https://cs.allegheny.edu/sites/jjumadinova

Instructor’s Office Hours

• Monday, Wednesday: 3:30 pm–4:30 pm (15 minute time slots)
• Tuesday, Thursday: 12:30 pm–1:00 pm (10 minute time slots)

To schedule a meeting with me during my office hours, please visit my website and click the “Schedule” link in the top left-side corner. Now, you can browse my office hours or schedule an appointment by clicking the correct link and then reserving an open time slot. Students are also encouraged to post appropriate questions to a channel in Slack, which is available at https://cs390s2021.slack.com/, and monitored by the instructor.

Course Meeting Schedule
Discussion and Hands-on Class Session (online):
Monday, Tuesday, Wednesday, Thursday, and Friday 9:30 am–12:30 pm EST

Detailed schedule of the course is located on its website: https://www.cs.allegheny.edu/sites/jjumadinova/teaching/390

All course assignments are available in their respective repositories in the course’s GitHub Organization: https://github.com/allegheny-computer-science-390-s2021

Course Description
A study of the design and implementation of cryptocurrencies using blockchain technologies. In addition to examining the mechanics behind cryptocurrencies, students develop and evaluate applications of Bitcoin and investigate its cultural context. Using state-of-the-art technology and in collaboration with Art 387, students complete projects, reporting on their results through both written documents and oral presentations. Students are invited to use their own departmentally approved laptop in this course; a limited number of laptops are available for use during class and lab sessions. Prerequisite: CMPSC 101.

Course Objectives
1. Understand fundamental concepts that underlie cryptocurrencies, with emphasis on Bitcoin.
2. Recognize the core components of Bitcoin and blockchain technologies.
3. Apply technical and cultural foundations of cryptocurrencies to solve new problems.
4. Continue developing team-working strategies with a diverse range software developers.
5. Enhance ability to write and present ideas about software in a clear, concise, and compelling fashion.

Performance Objectives
At the completion of this class, a student must be comfortable with the fundamental concepts that underlie cryptocurrencies. Students should have a clear understanding of blockchain technologies and be able to differentiate this technology from more traditional technologies. Students must be able to leverage the key features of cryptocurrency technologies to solve new problems. Finally, students should demonstrate the ability to use both in-person discussions and software tools to collaborate with a group of diverse team members.

Required Textbooks
Required:
• Mastering Bitcoin by Andreas M. Antonopoulos. This book is abbreviated as MB in the course schedule.
• Bitcoin and cryptocurrency technologies. This book is abbreviated as BCT in the course schedule.

Supplemental:
Blockchain Enabled Applications by V. Dhillon, D. Metcalf, M. Hooper.

Along with reading the required textbook, you will be invited to study additional articles from a wide variety of conference proceedings, scientific journals, and the popular press.

Course Policies
Grading
The grade that a student receives in this class will be based on the following categories. All of these percentages are approximate and, if the need to do so presents itself, it is possible for the course instructor to change the assigned percentages during the academic semester.

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Class Participation</td>
<td>30%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20%</td>
</tr>
<tr>
<td>Project</td>
<td>50%</td>
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</tbody>
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The grading categories have the following definitions:
• Class Participation: Participation will take forms such as engaging with programming-based activities, group work and discussions, and presentations. Participation activities are graded on a credit/no-credit basis. If a student is absent for a valid reason (illness, personal emergency, etc.) and that reason is communicated to the instructor in a timely manner, the participation activity for that period will be excused.
• **Quizzes**: After each class session, students are required to take a short, multiple-choice quiz that assesses conceptual understanding of covered material. The quiz is to be submitted before the beginning of the next class session. Unless prior arrangements are made with the course instructor, all students are expected to take each quiz test on the scheduled date.

• **Project**: The course project will provide an opportunity to design and implement a correct and carefully evaluated cryptocurrency inspired solution for a particular application using a programming language of their choice. Appropriate scaffolding will be provided to ensure continuous and timely completion of the project.

### Assignment Submission and Evaluation

All assignments will have a stated due date. Electronic versions of programming-based class activities and the course project must be submitted to a student’s GitHub repository and quizzes are to be submitted via provided Google Forms. No credit will be awarded for any course work that is not submitted correctly. Unless specified otherwise, all laboratory assignments must If special arrangements arise making it difficult for you to submit any assignment on time, please contact the instructor. Using a private GitHub repository the instructor will share grades and feedback on assignments as appropriate.

### Remote Attendance

Occasional technology problems that disrupt your participation will not harm your participation grade as long as this is communicated with the instructor, but as with illnesses and family emergencies, chronic absences for this reason will require a more extensive discussion with the instructor and may negatively impact your grade.

### Use of Computer Hardware and Software

Although the instructor will support you in the configuration of your own development workstation, it is the responsibility of each enrolled student to have an appropriate laptop and to be able to download and install the required software. Please schedule a meeting with the instructor if you are struggling with these tasks.

### Recording Policy (prepared by Campus Life and Community Standards Committee)

In remote teaching and learning contexts, there is an understanding that instructors (including faculty, coaches, staff, and facilitators) have the right to record class and discussion proceedings. All other participants must request permission of the instructor in advance before making any additional recordings. An instructor’s pre-recorded material, including lectures and class notes, may not be shared with anyone outside of the course’s current enrollment without the consent of the instructor. Similarly, under no circumstances may a recording, still, screenshot, picture, or any other media of any sort be altered or circulated by anyone outside of its original intent. No content may be distributed outside the circle of participants without the consent of all who appear or are heard. The college community is reminded of Allegheny College’s Recording Policy, outlined in 9.8 of the Faculty Handbook, as well as Allegheny’s Statement of Community. Violations will be referred to the Student Conduct system. Classes may also be recorded if approved as an educational accommodation through the Office of Student Disability Services. Faculty are further reminded that recordings of class activities are educational records protected under FERPA. While students
do not have a right to be anonymous in a class in which they are enrolled, they have the legal right to be anonymous to third parties. Please direct questions about FERPA to the Registrar.

**Class Preparation**

In order to minimize confusion and maximize learning, students must invest time to prepare for the class discussions, lectures, and group work sessions. This preparation includes a completion of a conceptual quiz after each class session as well as reading assigned material. In order to help students remain organized and to effectively prepare for classes, the course instructor will maintain a class schedule with reading assignments and presentation slides on the course website.

**Seeking Assistance**

Students who are struggling to understand the knowledge and skills developed in a class session are encouraged to seek assistance from the course instructor. Throughout the semester, students should, within the bounds of the Honor Code, ask and answer questions on the course’s Slack workspace. To ensure a suitable response, please request assistance from the instructor first through Slack before sending an email. Students who need the course instructor’s assistance must schedule a meeting through his website and attend the meeting with all of the details needed to discuss their question.

**Academic Integrity**

Allegheny College operates under an Honor Code, to which all students are subject. See "The Compass: Student Handbook". You should educate yourself appropriately as to how this applies to you. Plagiarism and other forms of intellectual dishonesty will not be tolerated.

It is understood that an important part of the learning process in any course, and particularly one in computer science, derives from thoughtful discussions with teachers and fellow students. Such dialogue is encouraged. However, it is necessary to distinguish carefully between the student who discusses the principles underlying a problem with others and the student who produces assignments that are identical to, or merely variations on, someone else’s work. While it is acceptable for students in this class to discuss their programs, data sets, and reports with their classmates, deliverables that are nearly identical to the work of others will be taken as evidence of violating the Honor Code.

**Religious Accommodations**

If you need to miss class due to a religious observance, please speak to the professor well in advance to make arrangements. See [http://sites.allegheny.edu/religiouslife/religious-holy-days/](http://sites.allegheny.edu/religiouslife/religious-holy-days/).

**Disability Services**

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Office of Disability Services at (814) 332-2898. Disability Services is located in Pelletier Library. Please do this as soon as possible to ensure that such accommodations are implemented in a timely fashion.
Learning Commons

If you are not already, you should become familiar with the Learning Commons, located in Pelletier Library (http://sites.allegheny.edu/learningcommons/). Among other things, the staff at the Learning Commons can assist you with study and time management skills, writing, and critical reading. You should know that if you are having trouble in this class, or if I think you can specifically benefit from their services, I will refer you to the Learning Commons. Experienced peer writing and speech consultants in the Learning Commons help writers and speakers to determine strategies for effective communication and to make academically responsible choices at any stage in the writing or speaking process and on assignments in any discipline. Both appointments and drop-in sessions are available. To view the hours of operation, and to make an appointment, visit the Learning Commons website.

Statement of Community

Allegheny students and employees are committed to creating an inclusive, respectful and safe residential learning community that will actively confront and challenge racism, sexism, heterosexism, religious bigotry, and other forms of harassment and discrimination. We encourage individual growth by promoting a free exchange of ideas in a setting that values diversity, trust and equality. So that the right of all to participate in a shared learning experience is upheld, Allegheny affirms its commitment to the principles of freedom of speech and inquiry, while at the same time fostering responsibility and accountability in the exercise of these freedoms.