

# SWE 4490- Fundamentals of Blockchain and Smart Contracts

Spring 2019

## Instructor

**Dr. Reza Parizi**

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**Office Location:** J 382

**Office Hours:** MWT 11:00AM – 3:00PM

### Email and Response Times:

I will check my email frequently and respond swiftly. During the week, I will respond to all emails within 24 hours. Over the weekend and holidays, I will respond to all emails within 48 hours or less.

## Course Description

This special course is designed to equip students with core foundational knowledge and innovative concepts, techniques, and industrial-strength tools for perceiving and developing blockchain and smart contracts in an engineering-supported manner. The course introduces blockchain-related practices and shows how to apply these practices to build decentralized applications using hands-on programming and research-led projects.

## Course Objectives

By the end of this course, you should be able to:

1. Understand how blockchains work, including private and public platforms.
2. Design secure smart contract applications on blockchains.
3. Know and be able to apply the concepts, tools, and frameworks for building blockchain decentralized applications.
4. Know and be able to develop and present a blockchain-related research paper.
5. Understand the state-of-the-art in the area as well as future trends.

## Prerequisites

- (CSE 1302 & CSE 3153) or (IT 1324 & CSE 3153) or CS 3304
- This course involves programming projects/assignments in the Solidity smart contract programming language. No prior experience with Solidity is expected. However, introductory programming course or prior



experience with programming (with any of: Python, Java, Javascript, C/C++, or others) is a prerequisite.

## Required Textbook

Textbooks are not required, required readings will be accessible online

## Grading

Successful completion of the course requires your active participation in all the learning activities and submission of the required materials. The course grade will be based on the following items:

Development Project (team)	50 %
Research Project (team)	30 %
Attendance/ Class Participation	20 %
<b>Total</b>	<b>100%</b>

**Grade Conversion:** A: (90-100), B: (80-89), C: (70-79), D: (60-69), F: (0-59)

## Course Outline

Below is an outline of the content in each unit of the course. All due dates for activities are in Eastern Standard Time (for details due dates refer to D2L's calendar).

The information in this outline is *subject to change*.

<b>Modules</b>	<b>Content/topic</b>	<b>Dates</b>
<b>Start Here</b>	Course introduction, syllabus	Week 1
<b>Module 1 –Blockchain Basics</b>	Understanding blockchain Blockchain stack and components Hash functions, digital signatures Blockchain platforms Evolution of blockchain Use cases	Weeks 1-4
<b>Module 2 - Smart Contracts</b>	Solidity programming Name registration application Hands on with Ethereum Blockchain	Weeks 5-8
<b>Module 3 - Decentralized Applications (Dapps)</b>	Decentralized apps development	Weeks 9-12
<b>Module 4 – Blockchain Security</b>	Introduction to tools Smart contracts vulnerabilities Verification of smart contracts	Weeks 13-14

## Course Expectations

### Expected time/ effort

Although the time varies widely for *each* student, the normal expectation for college-level classes is about 3-4 hour per week *per* credit hour, so expect to spend on average about **12-15 hours per week** on this class for fifteen weeks.

### Important policies

- You are responsible for all announcements and activities made in this course via D2L and in-class.
- No make-up work except for emergencies with proof (e.g. doctor's slip).
- You are required to attend and participate in all classes.

### Communication Rules

In any classroom setting there are communication rules in place that encourage students to respect others and their opinions. In an online environment the do's and don'ts of online communication are referred to as **Netiquette**. As a student in this course you should:

- Be sensitive and reflective to what others are saying.
- **Avoid typing in all capitals** because it is difficult to read and is considered the electronic version of 'shouting'.
- Don't flame - These are outbursts of extreme emotion or opinion.
- Think before you hit the post (enter/reply) button. You can't take it back!
- Don't use offensive language.
- Use clear subject lines.
- Don't use abbreviations or acronyms unless the entire class knows them.
- Be forgiving. Anyone can make a mistake.
- Keep the dialog collegial and professional, humor is difficult to convey in an online environment.
- Always **assume good intent** and **respond accordingly**. If you are unsure of or annoyed by a message, wait 24 hours before responding.

### Late Assignments

Please complete the required learning activities and submit your work on time, according to the dates listed in the D2L learning environment. Late work will be penalized by deducting 10% of its total grade per calendar day and will not be evaluated if submitted with more than 3 days delay.

### Student Responsibility

Distance learning requires more individual discipline than traditional classes, and requires that you have at least some control over your time and schedule. It is not easier or less time than face-to-face courses. During each week, students are expected to:

- Check D2L course website regularly;
- Follow the weekly guide (if any);
- Study the assigned material, such as; accompanying documents, research papers, PPT slides, etc.;
- Complete and submit assigned tasks/activities on time.
- Manage your meetings and responsibilities with client/product owner.
- Manage your meetings and responsibilities with your team members.

## Tips for Effective Learning

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Below are some tips for effective learning:

- **Check the D2L course website regularly.** Always be aware of the current status of the course. It might be helpful to subscribe to the RSS feeds within the News Tool, sign up for text message alerts, or subscribe to your posts within the Discussion Tool. By taking advantage of the tools within the environment and the posted learning material, you can maintain an enhanced learning experience.
- **Work closely with your instructor.** If you have any questions, please contact me immediately. The best way to contact me is via email, and you will be guaranteed to have a reply within 24 hours.
- **Begin your work early.** If you can start a task early, don't start late. Assuming you spend the same amount of time completing the task, starting later will be much more stressful than starting early. Never wait until the last minute to begin an task! You'll have no turnaround time if you need help or something happens.

## What is Plagiarism?

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Plagiarism is defined as the practice of taking someone else's work or ideas and passing them off as one's own. If you are unaware or uncertain on how to properly cite a particular source, please do not neglect to add the citation—that is considered plagiarism.

If you have questions on how to cite your work, please contact me immediately! For more information, please refer to the "Plagiarism Policy" under the *Policies* section of this syllabus.

## Turnitin

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Students agree that by taking this course all required **code/papers** may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Terms and Conditions of Use posted on the Turnitin.com site.

## Help Resources

### Contacts to get Help

Student Help Desk [studenthelpdesk@kennesaw.edu](mailto:studenthelpdesk@kennesaw.edu) or call 470.578.3555

D2L FAQ's [click here](#)

D2L Student User's Guide [click here](#)

UITs Student Training Workshop Schedule [click here](#)

### Additional Resources

Remote access to Library Resources: <http://library.kennesaw.edu/>

Student Support:

[http://learnonline.kennesaw.edu/resources/student\\_support\\_resources.php](http://learnonline.kennesaw.edu/resources/student_support_resources.php)

Tutoring and Academic Support:

[http://learnonline.kennesaw.edu/resources/tutoring\\_academic\\_support.php](http://learnonline.kennesaw.edu/resources/tutoring_academic_support.php)

Advising: <http://learnonline.kennesaw.edu/resources/advising.php>

Bookstore: <http://bookstore.kennesaw.edu/home.aspx>

## University Policies

### Academic Honesty

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/ falsification of University records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement.

### Plagiarism Policy

No student shall receive, attempt to receive, knowingly give or attempt to give unauthorized assistance in the preparation of any work required to be submitted for credit as part of a course (including examinations, laboratory reports, essays, themes, term papers, etc.). When direct quotations are used, they should be indicated, and when the ideas, theories, data, figures, graphs, programs, electronic based information or illustrations of someone other than the student are incorporated into a paper or used in a project, they should be duly acknowledged.

## Disability Statement

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Kennesaw State University provides program accessibility and reasonable accommodations for persons defined as disabled under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. Kennesaw State University does not deny admission or subject to discrimination in admission any qualified disabled student.

A number of services are available to help students with disabilities with their academic work. In order to make arrangements for special services, students must visit the Office for Student Disability Services and make an appointment to arrange an individual assistance plan. In most cases, certification of disability is required.

Special services are based on

- medical and/or psychological certification of disability,
- eligibility for services by outside agencies, and
- ability to complete tasks required in courses.

### **ADA Position Statement**

Kennesaw State University, a member of the University System of Georgia, does not discriminate on the basis of race, color, religion, age, sex, national origin or disability in employment or provision of services. Kennesaw State University does not discriminate on the basis of disability in the admission or access to, or treatment or employment in, its programs or activities.

The Americans with Disabilities Act (ADA), Public Law 101-336, gives civil rights protections to individuals with disabilities. This statute guarantees equal opportunity for this protected group in the areas of public accommodations, employment, transportation, state and local government services and telecommunications.

The following individuals have been designated by the President of the University to provide assistance and ensure compliance with the ADA. Should you require assistance or have further questions about the ADA, please contact:

- ADA Compliance Officer for Students  
470-578-6443
- ADA Compliance Officer for Facilities  
470-578-6224
- ADA Compliance Officer for Employees  
470-578-6030

For more information, go to: [http://www.kennesaw.edu/stu\\_dev/dsss](http://www.kennesaw.edu/stu_dev/dsss).