UNIVERSITY OF CALGARY
HASKAYNE SCHOOL OF BUSINESS

# FNCE 559.09 L01
# Decentralized Finance
## Course Outline – Fall 2022

Course content will be delivered **face-to-face**. In-person attendance is expected. Students should be prepared to pivot to online learning should current government or University protocols change. Please see the following pages for course details and schedules.

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| **Instructor** | Alfred Lehar |
| **Telephone** | 403.220.4567 |
| **Office** | SH 134 |
| **Email** | alehar@ucalgary.ca |
| **Office hours** | By appointment |
| **Website** | http://d2l.ucalgary.ca |
| **Lecture location** | SH 465 |
| **Lecture times** | Thursday 3:30PM – 6:15PM |

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| **Calendar Description** | Investigation of selected topics related to financial management, emphasizing the application of financial management principles to actual problems in the corporate sector. |
| **Course Description** | In this course we will go in depth to analyse blockchain data and smart contract output. Students will be trained in data analytics, blockchain technology and the latest Decentralized Finance (DeFi) protocols. |
| **Course Objectives** | By the end of this course students will be able to:<br>1. Analyze blockchain data<br>2. Evaluate the economics of smart contract based trading and lending platforms<br>4. Explain the most important DeFi protocols. |
| **Opportunities to contribute outside of the class** | Students are part of the DeFi lab, a research initiative around blockchain data. Students are invited to organize any DeFi related activities such as inviting guest speakers, develop software for use in the lab, minting a course NFT, or setting up their own blockchain. We run a DeFi reading group where academic papers are |

discussed once a week.

**Grade Scale**

The Haskayne School of Business endeavours to ensure consistency of final grades across courses and sections. Variations in distribution will always be considered by the instructor where called for by the performance in each individual class. The student does not have any 'right' to a certain grade, but is responsible for earning grades. The instructor has unfettered discretion to evaluate student performance and assign all grades.

| Grade | | Percentage Score | Grade Point Value | Description |
|---|---|---|---|---|
| **A+** | ≥ | 95.0 | 4.0 | Outstanding |
| **A** | ≥ | 90.0 | 4.0 | Excellent |
| **A-** | ≥ | 85.0 | 3.7 | Very good performance |
| **B+** | ≥ | 80.0 | 3.3 | Good performance |
| **B** | ≥ | 75.0 | 3.0 | Satisfactory performance |
| **B-** | ≥ | 70.0 | 2.7 | Minimum pass |
| **C+** | ≥ | 65.0 | 2.3 | All grades below B- are indicative of failure at the graduate level and cannot be counted toward the course requirements. |
| **C** | ≥ | 60.0 | 2.0 | |
| **C-** | ≥ | 57.0 | 1.7 | |
| **D+** | ≥ | 53.0 | 1.3 | |
| **D** | ≥ | 50.0 | 1.0 | |
| **F** | < | 50.0 | 0 | |

Note: See the "Academic Standing" section of the Faculty of Graduate Studies Calendar regarding grades less than B-.

**Grade Distribution**

| Due Date | Assessment | Weighting | Course Outcomes Assessed |
|---|---|---|---|
| Ongoing | Class Participation | 20% | 1, 2, 3, 4, |
| Projects (dates see schedule) | Blockchain, DeFi, Lending, and Token | 15% each (60% total, 30% group, 30% individual) | 1, 2, 3, 4, |
| Final Project | Final project presentation | 20%<br>(10% group, 10% individual | 1, 2, 3, 4 |
| | **Total** | **100%** | |

**Missed Assessment Policy**

Students must follow the guidelines outlined in Part B of the outline to request a deferral for missed work during the term, including quizzes, assignments, and exams.

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| **Late Policy** | No late submissions are allowed. |
| **Class Participation** | This is not for the class participation, but for your contribution. More precisely, your discussion and comments are evaluated in each class. Only active participation will earn you marks. If you do not talk in class you will get zero. Please bring your name tag to every class so that we can record your contributions. |
| **Projects** | Students will get a large dataset and have to analyse at least the basic questions defined below. To get better grades students are strongly encouraged to go deeper and find other interesting facts in the data. Students should work on this project in groups of 2 to 4. Students can switch groups during the class. Datasets will be provided on Alfred Lehar's server and the analysis should be performed in Julia. The code should be submitted to a GitHub archive. University central IT sometimes shuts down the network or the big computer. There are scheduled reboots on the last Thursday of every month in the early morning.<br><br>Blockchain project: You will get a set of databases that will include a list of blockchains, blocks, transactions, and log events. Each group will pick a different topic event. Minimum requirement: Provide descriptive statistics regarding the blockchains, blocks, transactions, and log events linked to the topic event selected. This project can help students understand Ethereum-like blockchains' structure and will require them to learn how to merge, organize, filter, and summarize data in Julia.<br><br>Token project: You will get all transfers of a specific token. Each group will pick a different token. Minimum requirement: plot weekly transfers and number of active addresses.<br><br>Dex project: You will get data on trades, liquidity injections and withdrawals of a Uniswap V2 compatible liquidity pool. Minimum requirement: Plot daily trading volume and value locked.<br><br>DeFi lending project: You will get data on loan liquidations at a popular lending protocol. Minimum requirement: Plot monthly liquidated amount and number of active liquidators. |
| **Final Project** | You should present an interesting DeFi project. This can either be your own invention or a detailed discussion of an existing project. The discussion should include economics as well as technical aspects of the project. All group members should be part of the presentation. The grade will be based on the content as well as your presentation. |
| **Outside class projects** | Throughout the course we will hand out homework/project assignments. Assignments/Projects may be on an individual or on a group basis depending on the assignment. Details on the submission process will be announced with the assignment. |
| **Assessment of Writing** | Writing skills are not exclusive to English courses and, in fact, should cross all disciplines. The University supports the belief that throughout their University |

careers, students should be taught how to write well so that when they graduate their writing abilities will be far above the minimal standards required at entrance. Consistent with this belief, students are expected to do a substantial amount of writing in their University courses and, where appropriate, members of faculty can and should use writing and the grading thereof as a factor in the evaluation of student work. The services provided by the Writing Support, part of the Student Success Centre, can be accessed by all undergraduate and graduate students who feel they require further assistance. In this course, your writing will be assessed as part of your grade in the following assessments: cases and presentation materials.

**Class Preparation & Desire2Learn (D2L)**

Lectures focus on the material presented in class and general discussion relating to the topic(s) outlined in the lecture schedule. Students are expected to read the assigned text chapters and readings before class, and be prepared for class discussion. Important information and additional readings are posted on Desire2Learn (D2L). Students should regularly check the Announcements section of D2L for ongoing notices.

Your instructor may not necessarily cover all of the materials in the chapter, but it is the responsibility of the student to understand the concepts presented in the textbook and lectures. If you are unsure of any of the concepts, please take the initiative to ask the instructor during class.

**Contacting Your Instructor**

Students requiring assistance are encouraged to speak to their instructor during class or during their office hours. Should you wish to meet with the instructor outside of office hours, please email us to make an appointment (**please include the Course number in the subject line**).

**Email Communication**

Email is commonly used by students to communicate with their instructor. However, it does limit the effectiveness of the communications and may not be the best way for instructors to answer student questions, especially those requiring an explanation of concepts covered in this course or some personal concerns. Therefore the instructor may request a telephone call or personal meeting.

**Internet & Electronic Communication Devices**

Any surfing of the Internet during lectures that is not directly related to the class discussion is distracting and strictly forbidden. Additionally, the use of any electronic devices (e.g., cellular phones/smartphones) for e-mailing, text-messaging, etc. is strictly prohibited. Please turn OFF your phone before the beginning of each lecture.

**Academic Integrity and Rigor**

**Academic integrity and rigor are critical components of a University degree.** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. **The Haskayne School of Business values ethical leadership and personal integrity, and expects its faculty, staff, and students to live these values**. In the online environment, certain additional measures will be put in place to help safeguard the integrity of online assessments and the intellectual property of the instructors.

## Class Schedule & Topics

*Please note that lecture topics and readings are tentative and subject to change. The dates of assessments will not be changed.*

Important dates (e.g. Block Week, Lecture start dates, Reading Week, etc.) can be found at the following web site: http://ucalgary.ca/pubs/calendar/current/academic-schedule.html

| TENTATIVE COURSE SCHEDULE FNCE 559 L01 (tentative, subject to change) | | |
|---|---|---|
| **DATE** | **DETAILS** | **Course Materials/ Readings** |
| **Sept 8** | Class overview, into DeFi, Ethereum Logs, Tokens | |
| **Sept 15** | Tokens and Decentralized Exchanges | |
| **Sept 22** | This week: 1:1 meetings Blockchain project Blockchain project presentation | **Blockchain project due** |
| **Sept 29** | This week: 1:1 meetings Dex and token project, no lecture | |
| **Oct 6** | DeFi lending, Liquidations | |
| **Oct 13** | Token project presentations | **Token Project is due** |
| **Oct 20** | Dex Project presentations | **DEX project due** |
| **Oct 27** | NFTs | |
| **Nov 3** | DeFi lending project presentations | **DeFi lending project due** |
| **Nov 17** | 1:1 meetings student projects | |
| **Nov 24** | Student Presentation | **Student final project presentation** |
| **Dec 1** | Smart contracts, CBDC | |
| ***No final exam*** | | |