University of Texas

Tom Serres and Bettina Warburg Course Packet

Course Landing Page Details

Title

Informatics: Blockchain and the Decentralized Economy

Course Number

I320

Professors

Bettina Warburg and Tom Serres

Room

N/A – Online only semester

Time

9:00am - 12:00pm CDT

Days

Fridays

Semester

Fall 2020

Topic Description

Blockchain and the Decentralized Economy

Prerequisites

I320 – Upper division standing. No prerequisites required.

Description

Built on the back of a blockchain computing stack, this course will focus on topics and research key to the transition to a decentralized economy. We will cover the dynamics of emerging technologies, highlight new ideas from leading entrepreneurs and researchers shaping this future, and provide students with an opportunity to build their research into a product or startup. Students will use lean methodologies and anchor their approach in content covered through the course.

The course will meet each week for 3 hours over the semester, and sessions will consist of online webinars (both synchronous and asynchronous). Sessions will include a mix of lecture-based content and discussion on selected topics, expert guest lectures, and product/startup building. At the end of the semester students will be graded on their ability to pitch and present their startup idea, the relevant empirical research supporting their ideas, and a succinct business plan for taking their idea to market.

Notes

The shift towards a decentralized economy is in full swing. Emerging technologies like Blockchain, AI/ML, and IoT are combining to radically change the way we engage with the economy, and are forcing us to rethink our businesses and societal interactions. At the heart of this new economy is a new blockchain-based computing stack that allows not just humans, but machines to transact products, services, and information.

This course will take a practitioner's approach to explaining these complex (and confusing) technologies, grounding our understanding in how they're evolving, and why they're paving the way for a future where machines represent a new consumer class: 50-billion devices armed with wallets and purchasing power. This future will transcend age-old models of commerce, supply chain, information management, finance, and governance to create something far more interesting: a distributed, transparent, and autonomous infrastructure for the decentralized exchange of value.

Throughout the course we will focus on topics and research key to the transition to a decentralized economy, hearing from leading entrepreneurs and researchers shaping these new opportunities. Topics will include an introduction to blockchain and its economic context, the technology stack of the decentralized economy, smart contracts, specific networks (Bitcoin, Ethereum, Dfinity, etc.), business use cases, regulatory considerations, and more. To help students apply this knowledge, the course also provides students the opportunity to practice the art of building startup projects through lean methodologies, anchored in the topic of decentralization of trade. Progressing from individual research to user interviews, peer review, and eventually prototyping, students will gain valuable experience in taking an idea from inception to pitching.

Part "big idea course" on where information and economics combine, part "startup bootcamp," students will come away with both a framework for thinking about the future, and a concrete final project that helps envisage that future.

Further Details on Course Design

This course is constructed from two distinct kinds of learning: Lecture and Build. We see these two as complementary and necessary to actually understanding the coming decentralized economy. Lectures feature relevant content and topic areas you should know and understand about blockchain. While the Build content is about how to come up with a hypothesis and test your ideas toward creating a startup or product. Combined, you get both theory and practice!

Lecture (on Teachable)

Each week we will cover a relevant topic across the blockchain/decentralized economy space. There will be relevant readings and materials each week on the topic being featured. You are expected to read lecture content and assignments before class and come to class prepared to discuss the content. Lectures are essentially a "flipped" classroom, where you digest the content at home (using the online resource, Teachable) before class, and come prepared to have a discussion on key points or clarify various questions.

Build

Build is where the rubber meets the road, and you have the chance to apply your learnings about blockchain to the real world, and to a problem you actually care about! Over the course of the semester, you will be tasked with weekly "build" assignments that help you research, iterate, and design a prototype that you will present as your final project. This section of our course is very much in line with "lean startup" methodology and should give you hands-on experience ideating, building, testing, and reworking a project through stakeholder interviews, mockups, and other tools, culminating in a final "pitch" with a supporting research brief (“Big Idea Research Brief”).

Each week we will spend class time hearing about the Build projects everyone is engaged with. While you will be doing the Build assignments independently, your

peers will be an integral part of your success, and you will be assessed by your peers at the end of the semester based on your contribution to the class.

In previous semesters student final projects have allowed them to change their career paths, receive grant funding, win a fellowship, and start their own companies -- so the sky is the limit!

UT Policies to Note

Title IX

Beginning January 1, 2020, Texas Senate Bill 212 requires all employees of Texas universities, including faculty, report any information to the Title IX Office regarding sexual harassment, sexual assault, dating violence and stalking that is disclosed to them. Texas law requires that all employees who witness or receive any information of this type (including, but not limited to, writing assignments, class discussions, or one-on-one conversations) must be reported. If you would like to speak with someone who can provide support or remedies without making an official report to the university, please email advocate@austin.utexas.edu. For more information about reporting options and resources, visit http://www.titleix.utexas.edu/, contact the Title IX Office via email at titleix@austin.utexas.edu, or call 512-471-0419. Although graduate teaching and research assistants are not subject to Texas Senate Bill 212, they are still mandatory reporters under Federal Title IX laws and are required to report a wide range of behaviors we refer to as sexual misconduct, including the types of sexual misconduct covered under Texas Senate Bill 212. The Title IX office has developed supportive ways to respond to a survivor and compiled campus resources to support survivors.

Students with Disabilities

Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement (DDCE), Services for Students with Disabilities (SSD) at http://ddce.utexas.edu/disability.

Class Recordings

Class recordings are reserved only for students in this class for educational purposes and are protected under FERPA. The recordings should not be shared outside the class in any form. Violation of this restriction by a student could lead to Student Misconduct proceedings.

Professor Biographies

Tom Serres Long Bio

Tom Serres is a Co-Founder and Managing Partner of *Warburg-Serres Investments*, an early stage venture capital fund focused on the decentralization of Trade and Blockchain Technology. He is a Co-Founder and Managing Partner of *Animal Ventures*, an investment advisory firm that builds and invests in tech startups, educates executives, and designs new ways for Fortune 500 companies to commercialize and leverage emergent technologies. These emergent opportunities include technologies such as Blockchain, Artificial Intelligence, Additive Manufacturing, and the Internet of Things. Animal Ventures has extensive

experience in industries such as food, pharmaceuticals, healthcare, trucking, shipping, logistics, online marketplaces, and fin-tech in and around the broader world of supply chain activities.

Tom lectures each semester as an Adjunct Professor at the *University of Texas School of Information in Austin*, and is Co-Author of *Asset Chains: The Cognitive, Friction-Free, and Blockchain-enabled Future of Supply Chains*, as well as the new textbook, *The Basics of Blockchain*. He is an entrepreneur with experience and expertise in a wide variety of sectors.

Prior to his brief deployment at the Boston Consulting Group, Tom started his first company, *Rally* — the largest political fundraising platform in the United States. Rally garnered widespread attention for raising the largest online-only Series A funding round ever and was recognized as one of the most promising companies of 2013. While serving as Founder and CEO of Rally, Tom was named one of America's Most Promising CEOs under 35 by *Forbes*.

Tom previously hosted a show called *Tech on Politics* which features interviews with some of the greatest minds in technology, media, venture capital, and government. Discussions rove over the convergences of technology, politics, and government.

Tom attended the University of Texas at Austin McCombs School of Business, and is an occasional writer and speaker on these topics; he and his work can be found in such diverse outlets as *Wired*, *CNN*, *Bloomberg*, and *CNBC*.

Tom Serres Short Bio

Tom Serres is a Co-Founder and Managing Partner of *Warburg-Serres Investments*, an early stage venture capital fund focused on the decentralization of trade and Blockchain Technology. He is a Co-Founder and Managing Partner of *Animal Ventures*, an investment advisory firm that builds and invests in tech startups, educates executives, and designs new ways for Fortune 500 companies to commercialize and leverage emergent technologies. He was previously founder and CEO of Rally, the largest political fundraising company in the United States, named one of America's Most Promising CEOs under 35 by *Forbes*. Tom is an Adjunct Professor at the *University of*

Texas School of Information in Austin, and previously hosted *Tech on Politics* a podcast where he interviewed some of the greatest minds in technology, media, venture capital, and government on tech and public policy. He is Co-Author of *Asset Chains: The Cognitive, Friction-Free, and Blockchain-enabled Future of Supply Chains* as well as *The Basics of Blockchain*, and attended the University of Texas McCombs School of Business in Austin.

Bettina Warburg Long Bio

Bettina Warburg is a Co-Founder and Managing Partner of *Warburg-Serres Investments*, an early stage venture capital fund focused on the decentralization of trade and Blockchain Technology. She is a Co-Founder and Managing Partner of *Animal Ventures*, an investment advisory firm that builds and invests in tech startups, educates executives, and designs new ways for Fortune 500 companies to commercialize and leverage emergent technologies. These emergent opportunities include technologies such as Blockchain, Artificial Intelligence, Additive Manufacturing, and the Internet of Things. Animal Ventures has extensive experience in industries such as food, pharmaceuticals, healthcare, trucking, shipping, logistics, online marketplaces, and fin-tech in and around the broader world of supply chain activities. She is one of the first speakers at TED to unpack the topic of blockchain, and her talk, "*How the Blockchain will radically transform the economy*," has been seen by over 5 million people, making it the most viewed TED talk on the topic of Blockchain to date. Bettina's collaboration with *Wired Magazine* to help explain Blockchain at 5 levels of difficulty has also been seen by over 2 Million people.

She was executive producer of a show called *Tech on Politics* which features interviews with some of the greatest minds in technology, media, venture capital, and government. Discussions rove over the convergence of technology, politics, and government.

Bettina lectures each semester as an Adjunct Professor at the *University of Texas School of Information in Austin*, and is co-author of *Asset Chains: The Cognitive, Friction-free, and Blockchain enabled Future of Supply Chains*, as well as the new textbook, *The Basics of Blockchain*. She has given talks at TED, Wired, IBM Think, VMWare, The Business Council, Credit Suisse Latin American Investment Conference, Smart Cities, Merck & Co's Annual Technology Innovation Conference, The Skoll World Forum, Salzburg Global Seminar, San Francisco's City Innovate Summit, and numerous other conferences and universities around the world. Bettina's work has been cited in publications such as Wired Magazine, BBC News, The Atlantic, Center for Public Impact, ICMA.org, and the San Francisco Chronicle. Bettina received her MSc from Oxford University and BS from Georgetown University's School of Foreign Service, and developed a keen interest in global governance and cultural diplomacy.

Bettina Warburg Short Bio

Bettina Warburg is a Co-Founder and Managing Partner of *Warburg-Serres Investments*, an early stage venture capital fund focused on the decentralization of Trade and Blockchain Technology. She is a Co-Founder and Managing Partner of *Animal Ventures*, an investment advisory firm that builds and invests in tech startups, educates executives, and designs new ways for Fortune 500 companies to commercialize and leverage emergent technologies. She is one of the first speakers at TED to unpack the topic of blockchain, and her talk, "*How the Blockchain will radically transform the economy*," has been seen by over 5 million people, making it the most viewed TED talk on the topic of Blockchain to date. Bettina's collaboration with *Wired Magazine* to help explain blockchain at 5 levels of difficulty has also been seen by over 2 Million people. Bettina is an Adjunct Professor at the *University of Texas School of Information in Austin,* co-author of *Asset Chains: The Cognitive, Friction-free, and Blockchain enabled Future of Supply Chains*, and was previously the executive producer of a show called *Tech on Politics*. Bettina is co-author of the new blockchain textbook, the *Basics of Blockchain.*

Course Details

Semester

Start: August 28

End: December 4

Course Days

Friday mornings 9am-12pm CDT with a note that sessions will all be virtual.

Course Calendar

**Guest lecturers awaiting confirmation and can shift depending on instructor schedule*

Week	Date	Session Topic	Guest Lecturer*	Location
1	Friday, August 28	Course Overview	None	Online
2	Friday, September 4	Welcome to the Decentralized Economy	None	Online
3	Friday, September 11	Blockchain - It's not that different from the Internet!	None	Online
4	Friday, September 18	Blockchain 1.0, 2.0, and 3.0	None	Online
5	Friday, September 25	Crypto-Assets & New Markets - Part 1	Illia Polosukhin, NEAR Protocol	Online
6	Friday, October 2	Crypto-Assets & New Markets - Part 2	None	Online
7	Friday, October 9	Automating Business Through Code	None	Online

8	Friday, October 16	The Future of Supply Chains	None	Online
9	Friday, October 23	Business in the Decentralized Economy: Use Cases & Enterprise Investment	Salvatore Ternullo, KPMG	Online
10	Friday, October 30	DACs, DAOs, & The Future of Organizations	None	Online
11	Friday, November 6	Blockchain Governance - Social & Technical Power	None	Online
12	Friday, November 13	Regulation in the Decentralized Economy	Zach Herbert, Foundation Devices	Online
13	Friday, November 20	Capstone Rehearsals	None	Online
14	Friday, December 4	Capstone Presentations	Guest Judges	Online

Assessment

Assignment	**Percentage of Course Grade**	**Due Date**
Class Participation	30%	Throughout Course
Materials Presentations	20%	Weekly from September through December

Capstone Project (Pitch & Research Brief)	50%	Final class - December 4

Grading

There is no midterm or final exam for this course. Grading will follow Texas School of Information recommendations (including A, A-, B+, and so on).

Class Participation

The class participation component of your final grade will be based on general attendance in classes, the number and quality of questions asked during discussions and guest lectures, participation in class activities and presentations, and providing quality feedback to support your peers during and outside of instruction. Note: There are only 14 classes – if you do not attend class, it directly affects your grade.

Class sessions are recorded on Zoom. Class recordings are reserved only for the use of members of this class (students, TAs, and the instructor) and only for educational purposes. Recordings should not be shared outside the class in any form. Violation of this restriction could lead to Student Misconduct proceedings.

Materials Presentations

The materials presentation component of your final grade will be based on the slide materials you submit/present to the instructors each week, your preparedness to present during class, and ultimately the contents of each slide presentation. Slide materials should include all evidentiary support related to your research topic of choice, and are assigned weekly. *If you miss a class, you can still receive credit for materials produced, so please be sure to send them.*

Capstone Project

Your capstone project is a culmination of work across the entire semester. It will be assessed in the following ways:

- Overall Presentation
- Quality of Research
- Quality of Business Strategy
- Quality of Prototype Design
- Creativity
- General Technical Comprehension
- Peer Assessment

The instructors and selected guest lecturers will judge Capstone Projects across a number of attributes, and will designate each presentation as one or more of the following:

- Best Overall
- Runner Up
- Best Research
- Best Business Plan
- Best Design and Prototype
- Most Creative
- Most Technically Advanced
- Peer Favorite

Presentations will be stack-ranked with the first and second place coming in as Best Overall and Runner Up. The other attributes will be assigned to each presentation and will be factored into your overall grade at the end of the semester. For example, your project might not win Best Overall presentation but you can receive Most Creative or Most Technically Advanced as another method to influence your grade at the end of the semester. You will also be assessed by your peers at the end of the semester based on your contribution to the class.

In addition to your live pitches, you will prepare and submit a written research paper that documents your research over the course of the semester in the form of a "Big Idea Research Brief." See the guidelines provided in Canvas / by your instructors for further details. The paper should be submitted as "ready to publish" and may be incorporated in the Research Gate or other online portal for this course.

How to Excel (above and beyond requirements)

Entrepreneurs are resourceful and relentless. The blockchain community, at large, is comprised of numerous researchers and academic professionals who, by industry demand, were driven to become entrepreneurial. As you navigate this class you will see many who started as researchers grow into entrepreneurs and business leaders. You should plan to build a network/community to support your effort inside and outside of the classroom. You should seek additional mentorship through other entrepreneurs, designers, researchers, and academics to support your project. You will be one-part entrepreneur and one-part researcher. If you anticipate completing your project without assistance from external sources, you will likely *not* excel. Blockchain is non-competitive technology and ultimately a team sport. The instructors of this course want students to learn through live experimentation, resourceful time management, relentless drive, and pragmatic hands-on learning.

The Syllabus *(Work in Progress)*

Note: Teachable will represent the most accurate version of all weekly readings and assignments. This document is merely a representation of the plan at the beginning of the semester.

Week 1 | Friday, August 28: Course Overview!

Location: **Online**

Learning Objectives:

- Introduce instructors
- Review course architecture
- Review course materials
- Review assessment and grading
- Student introductions
- Review of assignments for Week 2 (reading & build)

Lecture (Teachable): None

Build (in Class): Introduction to the Research and Discovery Phase

One of the fastest ways to learn about the decentralization of a given industry or professional activity is to identify an idea or research topic to pursue and begin researching, discovering, and building this new idea using iterative, lean startup-style tools. Together, we will talk through some of those tools and the process for preliminary research that students will use throughout the class.

Assignments for Next Session:

1. Identifying a build project.
    - Identify an industry or professional activity you're familiar with, and develop a research and discovery plan to identify the elements that will be most impacted by the transition from our traditional digital economy to a decentralized economy.
    - Create 2-3 slides explaining why you chose this particular topic. Be prepared to present these slides in class the following week.
2. Beginning to develop a community and resource network locally.

- Attend a blockchain-based meetup: Ethereum/Bitcoin, or local club on campus with the goal of getting to know 1-3 (non-class) attendees. We recommend doing this throughout the semester.
    - Texas Blockchain Student Group
    - Austin Ethereum Meetup
    - Austin Blockchain Collective (monthly)
    - Austin Blockchain Technology
    - Austin Bitcoin Meetup

Week 2 | Friday, September 4: Welcome to the Decentralized Economy!

Location: Online

Learning Objectives:

- Describe the story of trade from early agrarian days to now, and how blockchain fits this story
- Define blockchain technology historically, conceptually, and technically
- Delve into the components of the technical definition of blockchain
- Begin to cover the evolution of blockchains toward decentralized computers

Lecture (Teachable): Welcome to the Decentralized Economy!

We will launch into our first framing topic for the course: the Decentralized Economy. Leaning on some of the pre-reading materials, we will cover the evolution of trade and trust from our early agrarian days, to formal institutions, to our current digital economy, and finally to the future of greater economic decentralization. This narrative grounding in our human history should help students begin to think about ways blockchain and new technologies will be challenging older models and opening up new opportunities.

Pre-reading Resources:

Pre-read Topic	**Pre-read Materials**
Lecture	Chapter 1: "Blockchain Fundamentals," *Basics of Blockchain*

	Extra (Book): *Institutions, Institutional Change, and Economic Performance* - Chapters 1, 4, 5, 6 Extra (Article): The blockchain revolution Extra (Video): How the Blockchain will Radically Transform the Economy Extra (Video): Vitalik Buterin explains Ethereum Extra (Video): DEVCON1: Understanding the Ethereum Blockchain Protocol - Vitalik Buterin Extra (Video): History of the Blockchain
Build	Chapter 1: *The Lean Startup*

Build (in class): Research & Discovery Review and Prepare for Week 3

- Students will present the industry or professional activity they chose, using 2-3 slides explaining why they chose this particular topic. The class will offer constructive feedback and ideas to help further each student's pursuit.
- In preparation for your next assignment we will talk about user empathy and interviews. We will describe the upcoming assignment and think through good interview candidates and develop relevant initial questions.

Assignments for Next Session:

1. Performing user interviews for your build project.

Strong research into your given topic often begins with user empathy and general due diligence. This week you will expand your knowledge by interviewing key stakeholders in and around the industry topic you've chosen. The empirical research you gather will begin to help you build an argument and seed the kernel of an idea.

- Conduct interviews with at least 3 stakeholders on your topic.
- Catalog the data and information gathered from your interviews, and create 2-3 slides explaining who you talked to, what questions you asked, why you asked these questions, and formulate an initial opinion from your observations as to how decentralized computing might impact their world. Be prepared to present these slides in class next week.

Week 3 | Friday, September 11: Blockchain - It's not that different from the Internet!

Location: Online

Learning Objectives:

- Dispel the hype of what blockchain is NOT and talk through definitions
- Introduce the basic framework of core, middleware, app layers of the blockchain tech stack and the comparison of a decentralized economy to our current digital economy
- Discuss whether we are headed for a multiprotocol or single-protocol world

Pre-reading Resources:

Pre-read Topic	Pre-read Materials
Lecture	Chapter 2: "The Technology Behind Blockchain," *Basics of Blockchain* Extra (Article): OSI: The Internet That Wasn't How TCP/IP eclipsed the Open Systems Interconnection standards to become the global protocol for computer networking Extra (Article): Rough Consensus and Running Code' and the Internet-OSI Standards War Extra (Video): Protocol Wars
Build	Chapter 2: *The Lean Startup* Extra (Video): Building Hi-Tech Skyscrapers

Lecture (Teachable): Blockchain – It's not that different from the Internet!

Having talked about the economic story leading to blockchain in our first session, we now dive into more of the technical trajectory toward decentralized technologies. If we think about the Internet as the core technology that brought about the modern digital economy we know and use every day, then blockchain is a similar core technology opening up the decentralized economy of the future. We will discuss simple waves of technology adoption from core infrastructure to middleware, and eventually applications. Following the analogy of the Internet will help us dispel some of the hype around blockchain and understand where we are in its development trajectory. We will also cover some of what blockchain is NOT, and how to use the progression up the technology stack as a framing for this course going forward.

Build (in class): Research & Discovery Review and Prepare for Week 4

- Students will each present the data collected from their user interviews using 2-3 slides explaining who you talked to, what questions you asked, why you asked these questions, and the initial opinion from your observations as to how decentralized computing might impact their world. Each student will receive constructive feedback on their research from the rest of the class.
- We will discuss the upcoming assignment

Assignment for Next Session: Research and Discovery Phase

1. Developing a Signal Case Study

While decentralized computing and blockchain are newer fields, there are already many use cases, startups, proofs of concept, and literature describing ways to implement this technology against a real-world problem. It's important to understand where your research and budding idea sits in the overall evolution of this technology stack, and the maturity of the blockchain industry. To help flesh out your idea further, use the template provided (see Canvas) to develop a Signal Case Study on one of the most promising projects in your space.

Week 4 | Friday, September 18: Blockchain 1.0, 2.0, and 3.0

Location: **Online**

Learning Objectives:

- Introduce the evolution of blockchain from 1st gen, to 2nd and 3rd gen
- Introduce the difference between existing apps and new kinds of apps emerging from this tech stack

Pre-reading Resources:

Pre-read Topic	**Pre-read Materials**
Lecture	(Article): Why Decentralization Matters (Article): The Meaning of Decentralization Extra (Paper): Bitcoin White Paper

	Extra (Paper): Ethereum Yellow Paper Extra (Video): Developer Network Demo | New York Blockchain Week 2019 Extra (Video): Ten Minute DFINITY Presentation at Nasdaq
Build	Chapter 3: *The Lean Startup*

Lecture (Teachable): Blockchain 1.0, 2.0, and 3.0

Since 2008, with the publication of the Bitcoin whitepaper, blockchain has been in the news. But what has happened to the technology in the last 10 years? In this session we will unpack what has changed about blockchain from Bitcoin to the Ethereum network, and now third-generation blockchains. This is largely a story about the rise of decentralized computing, and – in combination with our first two sessions – should help solidify our economic and technical understanding for why the decentralized economy is approaching. We will also start to dive into the application layer of this computing stack by thinking through 1) which kinds of apps will transition over to decentralized versions, and 2) which completely new business models and apps can be built using this new infrastructure.

Build (in class): Research & Discovery Review

- Students will present their Signal Case Study using 2-3 slides explaining why they chose the signal, and relevant features that inform your own topic for further research.
- We will discuss the pitching session coming up next class

Assignments for Next Session: Research & Discovery Phase

1. Soliciting peer review for your build project.

Distributed and decentralized computing brought about by advances in blockchain technology is still very nascent and scientifically driven. It's important to understand where your research and budding idea sits in the overall evolution of this technology stack, and the maturity of the blockchain industry. Fleshing out an idea further can often require critical peer review to help sharpen and advance of your general idea.

- Identify at least 3 peers within this class, or elsewhere if preferred, and engage in a dialog with them to advance your idea. Obtain critical feedback on the idea, possible shortcomings, notable talking points that garner the greatest degree of

interest, and overall feedback on the foundational components of what you're choosing to pursue.

- Catalog the data and information gathered from your 3 peer reviews, and create 2-3 slides explaining who you talked to, what questions they asked, what they thought was most interesting, least interesting, where possible shortcomings might exist, and overall feedback on the topic you're choosing to pursue. Be prepared to present these slides in our upcoming class.

Week 5 | Friday, September 25: Crypto-Assets & New Markets - Part 1

Location: **Online**

Learning Objectives:

- Introduce a taxonomy of crypto-assets: "currencies," commodities, tokens, etc.
- Review the function of tokens in blockchain networks
- Introduce nuances of new assets and markets

Pre-reading Resources:

Pre-read Topic	**Pre-read Materials**
Lecture	Chapter 3: "Bitcoin and Crypto-assets," *Basics of Blockchain* Extra (Article): The Anatomy of ERC721 - Understanding Non-Fungible Ethereum Tokens Extra (Video): Synthetic Assets
Build	Chapter 4: *The Lean Startup* Extra (Video): Mike Maples Jr.: Dare to Do Legendary Things Extra (Website): Google Design Sprints Extra (Video): Steve Jobs "Marketing Is About Values"

Lecture (Teachable): Crypto-Assets & New Markets – Part 1

Fortnite, the gaming success story of the last few years, made $3 billion in revenue in 2018 selling virtual dance moves to players. But this is just the tip of the iceberg when it comes to the kinds of digital assets and potential for new markets now that blockchain enables digital uniqueness and verified transferability online. We will spend this class

discussing the kinds of assets blockchain enables, from crypto-“currencies” to commodities, and utility tokens.

Build (in class): Research & Discovery Review: Moving into Design Phase

- Students will present the data and information gathered from your 3 peer reviews, using 2-3 slides explaining who you talked to, what questions they asked, what they thought was most interesting, least interesting, where possible shortcomings might exist, and overall feedback on the topic you’re currently pursuing.
- We will also discuss moving into the design phase of our projects by introducing the idea of storyboarding. Storyboarding is an important skill for design, and we will review this tool as well as expectations for the upcoming assignment. In preparation for your storyboarding we will do some in-class activities, such as exercises that turn your idea into a blockbuster movie title, establish a brand, and develop a tagline.

Assignments for Next Session: Design Phase

1. Storyboarding your build project.

By now you should have the kernel of an idea swirling around in your head, and you should have obtained important and critical feedback from your peers and various other industry experts on your topic. Now, it’s time to build a narrative and a storyboard around what you’re interested in pursuing.

- Step out of the weeds a bit and create a storyboard around your idea. This can be done in any mixed media form that you choose. Create a podcast audio story, a keynote or powerpoint presentation, a video, a poster board, an infographic, a drawing, or any other form of media you think will help creatively communicate your idea. The key here is that you should be able to simply, but effectively, communicate the big idea is less than 5 minutes.
- Your storyboard should be based on everything you’ve learned and gathered thus far. Be prepared to present your mixed media storyboard in class the following week.

Week 6 | Friday, October 2: Crypto-Assets & New Markets - Part 2

Location: Online

Learning Objectives:

- Continue discussion of the taxonomy of crypto-assets: phygitals, synthetic assets
- Review the EVM and smart contracts
- Continue discussion of nuances of new assets and markets

Pre-reading Resources:

Pre-read Topic	Pre-read Materials
Lecture	Chapter 4: "Ethereum and Smart Contracts," *Basics of Blockchain* Extra (Article): The Anatomy of ERC721 - Understanding Non-Fungible Ethereum Tokens Extra (Video): Synthetic Assets
Build	Chapter 5: *The Lean Startup* Extra (Video): Don Valentine, Sequoia Capital: "Target Big Markets" Extra (Article): Why "Uber for X" startups failed: The supply side is king

Lecture (Teachable): Crypto-Assets & New Markets – Part 2

Fortnite, the gaming success story of the last few years, made $3 billion in revenue in 2018 selling virtual dance moves to players. But this is just the tip of the iceberg when it comes to the kinds of digital assets and potential for new markets now that blockchain enables digital uniqueness and verified transferability online. We will spend this class discussing the kinds of assets blockchain enables, from crypto-"currencies" to commodities, and utility tokens. This is part 2 in our conversation about crypto-assets and new markets.

Build (in class): Design Work Review and Preparation for Next Class

- Students will each present their storyboards and solicit valuable feedback on their design work

Assignments for Next Session: Design Phase

1. Developing Signal Case Studies for your project.

Now that you have storyboarded an idea you can dive into some deeper research. Surface some of the best signals in your target space (at least 2) and develop a Signal

Case Study for each. Use the Signal Case Study guidelines provided (see Canvas). The signals you choose should collectively help you articulate what is already interesting in the field of Web 3 around your topic. You will want to be sure any product or startup you build is well differentiated from what is already emerging. Submit all cases ahead of class by email.

- Prepare 2-3 slides to present the Signals you chose at a high level so that you can solicit feedback in class.

Week 7 | Friday, October 9: Automating Business through Code

Location: **Online**

Learning Objectives:

- Discuss what it means to automate business in the future
- Smart contracts as simple automation
- Discuss the idea of autonomous, persistent software applications

Pre-reading Resources:

Pre-read Topic	**Pre-read Materials**
Lecture	(Article) Smart Contracts: Building Blocks for Digital Markets by Nick Szabo (1996) (Article) What's a Smart Contract and How Does It Work?
Build	Chapter 6: *The Lean Startup* Extra (Video): Testing and Metrics are Imperative

Lecture (Teachable): Automating Business through Code

Applications and software can often be boiled down to a series of transactions and conditions. Sometimes those activities lead to a product, and other times they lead to a service. In both cases, there are ways of simplifying and even automating business activities as we begin to integrate emerging technologies. While this isn't a session on how robots will take over our lives, it is a practical immersion in the how and why

blockchain-based automation is increasingly intersecting with devices, robots, and algorithms. This topic also opens up major questions about ethics and governance – who builds these tools, and what happens when things go wrong?

Build (in class): Design Work Review and Preparation for Next Week

- Students will present their Signal Case Studies at a high level and solicit feedback on any major signals missing or further suggested research areas to explore.
- We will discuss the relevance of vision, mission, hypothesis and market for a startup in preparation for the coming week's work

Assignments for Next Session: Design Phase

1. Building the business case for your build project.

Now that you have your storyboard, it's time to begin building your pitch deck. We'll begin first with Mission, Vision, Problem Statement, Hypothesis, and Target Market.

- Create 3-5 slides highlighting each of the stated objectives, and be prepared to present in the upcoming class the following week.
- In 3-5 sentences or less, articulate the big idea (vision)
- In 3-5 sentences or less, articulate the path to victory (mission)
- In 3-5 sentences or less, articulate the hypothesis for your idea (If this, then that)
- In 3-5 sentences or less, articulate the target market for your idea (who is this for)
- In 3-5 sentences or less, articulate the problem you are attempting to solve, why your target market will want this problem solved, and how your hypothesis ties back into solving this problem.

2. Develop a detailed outline for your Big Idea Research Brief using the guidelines provided. Be sure to include the signals you are planning on leveraging. You do not need to have lots of prose, but be sure to include as much as you have already gathered.

Week 8 | Friday, October 16: The Future of Supply Chains

Location: **Online**

Learning Objectives:

- Dive deeper into supply chains to better understand how transacting both digital and physical things will change
- Look at specific industries using blockchain for supply chain projects
- Discuss the connection points between the physical and digital worlds (oracles, etc.)

Pre-reading Resources:

Pre-read Topic	Pre-read Materials
Lecture	Extra (Paper): *Asset Chains: The Cognitive, Friction-Free, and Blockchain-enabled Future of Supply Chains* Extra (Article): China hacked HPE, IBM and then attacked clients Extra (Article): The Next Economic Growth Engine Scaling Fourth Industrial Revolution Technologies in Production
Build	Extra (Video): Product Management as CEO Training Extra (Article): The Third Answer: How Market-Creating Innovation Drives Economic Growth and Development

Lecture (Teachable): The Future of Supply Chains

Supply chains are one of the areas we are seeing many new technologies combine – from 3D printing to augmented intelligence to blockchain. Understanding how and why multiple vendors might want to create a shared reality to collaborate helps us envision some new models of supply chain activity in the future.

Build (in class): Design Work Review and Preparation for Next Week

- Student will present their mission, vision, etc. and solicit feedback and input from the class
- We will discuss product experience and prepare for our upcoming assignment

Assignments for Next Session: Design Phase

1. Developing a user experience for your product/project.

Now that you have your first set of opening slides, it's time to research some new design parameters by further researching the product experience and who the ultimate user will be. You will accomplish this by going back to some of the initial stakeholders

you originally spoke to, and perhaps some new ones to begin designing your ultimate product experience.

- Build a database or spreadsheet of minimum viable requirements that will allow you to test your hypothesis through the eventual creation of a minimum viable product. What must your idea accomplish in order to validate your idea, and what micro-experiments can your idea be designed around such that usage will provide you with new insights and new data to validate through iterations?
- Conduct follow up interviews and gather feedback from critical stakeholders. Share with them what you've accomplished thus far, and gather feedback on how this idea might be accomplished.
- Gather requirements that will build into a set of product features for you to build a minimal viable product for you to run product experiments to test your hypothesis.

Data gathered during this phase of your project should be targeted and anchored in experiment design so that you can begin building a minimum viable product for the remainder of the semester.

Week 9 | Friday, October 23: Business in the Decentralized Economy - Enterprise Use Cases

Location: **Online**

Learning Objectives:

- Evaluating "whether you need" a blockchain for a business project, and review of relevant consensus mechanisms
- What are various use cases for blockchain that open up new business opportunities?
- Review case studies from various industries currently experimenting with blockchain

Pre-reading Resources:

Pre-read Topic	Pre-read Materials

Lecture	Chapter 5: "Project Management, Use Cases and Hyperledger," *Basics of Blockchain* Extra (Video): Introduction to Consensus
Build	Chapter 7: *The Lean Startup* Chapter 8: *The Lean Startup* Extra (Video): Quick and Frequent Product Testing and Assessment

Lecture (Teachable): Business in the Decentralized Economy - Enterprise Use Cases

Enterprises around the world – from major insurance companies to big pharma, to global shipping and logistics businesses – are all experimenting with blockchain and emerging technologies like IoT and AI to help automate many of their activities. In this session we will cover several case studies of businesses using blockchain to solve real use cases and prepare for the future. What are some of the reasons enterprises find blockchain so appealing? How will enterprises integrate blockchain in the long term? This will help prepare students for their own business idea development and startup pitching throughout the remainder of the course.

Build (in class): Design Work Review and Preparation for Next Class

- Students will present their minimum viable product requirements and solicit feedback.
- We will spend class time talking about iteration and additional tools for tweaking a design and set of requirements.

Assignments for Next Session: Design Phase

1. Iterating on your project.
    - Continue previous week's assignment by further tweaking your design and requirements
    - Solicit external advice and feedback from technical or other experts (e.g at blockchain club meetups)
2. Continue developing your Research Brief.

Week 10 | Friday, October 30: Business in the Decentralized Economy – Enterprise Investment

Location: **Online**

Learning Objectives:

- Enterprise consortia projects and what they're about
- Understanding enterprise strategy for the decentralized economy
- Investing up the stack

Pre-reading Resources:

Pre-read Topic	**Pre-read Materials**
Lecture	Chapter 5: "Project Management, Use Cases and Hyperledger," *Basics of Blockchain* Extra (Video): Introduction to Consensus
Build	Chapter 9: *The Lean Startup*

Lecture (Teachable): Business in the Decentralized Economy – Enterprise Investment

While enterprises have experimented with blockchain use cases, they are also trying to evaluate who to work with -- both across industry competitors and blockchain technology ecosystems. In this session we will cover the topic of consortia -- why and how enterprises are collaborating. We will then dive into the investment opportunities for enterprises and how they can strategize to invest up the blockchain/decentralized computing stack.

Build (in class): Design Work Review and Preparation for Next Class

- Students will review any tweaks made to their existing plan and solicit feedback
- We will discuss the idea of essentialism

Assignments for Next Session: Design Phase

1. Maximizing essentialism in your project design

It's time to break out that sketch book. You don't need to be an artist to sketch out an idea, but it is a good idea to begin sketching out how a user might interact with these requirements, use your application or tool, experience your experiment, and ultimately translate the requirements you've been gathering into product features to create your minimum viable product.

- Review your minimum viable requirements data set, and maximize them for essentialism. That is, what are the most essential requirements you've gathered?
- Stack-rank them by designating essential vs. non-essential, and organize them for use in the creation of a minimum viable product.
- Create 2-3 slides articulating what the requirements are, how you stack-ranked them and why, and identify which requirements will ultimately be included in your minimum viable product. Be prepared to present your slides in our upcoming class.

2. Continue developing your Research Brief.

Week 11 | Friday, November 6: DACs, DAOs, & the Future of Organizations

Location: **Online**

Learning Objectives:

- Discuss what it means to move from automating software to automating organizations and businesses in the future
- Review the "nexus of contracts" idea from Ronald Coase
- Unpack "The DAO" case study

Pre-reading Resources:

Pre-read Topic	**Pre-read Materials**
Lecture	Chapter 6: "The Future of Blockchain," *Basics of Blockchain* Extra (Paper): *The Nature of the Firm* Extra (Paper): SEC report on "The DAO"

	Extra (Video): Slock.it DAO demo at Devcon1: IoT + Blockchain Extra (Article): DAOs, DACs, DAs and More: An Incomplete Terminology Guide Extra (Article): CRITICAL UPDATE Re: DAO Vulnerability Extra (Article): An Overview of the Industry's Top DAOs
Build	Chapter 10: *The Lean Startup* Extra (Article): How To (Actually) Calculate CAC Extra (Video): The Customer Development Process. 2 Minutes to See Why Extra (Video): The Customer Development Process Extra (Video): The Lean Approach: Getting Out of the Building: Customer Development

Lecture (Teachable): DACs, DAOs & The Future of Organizations

Business and organizations can often be boiled down to a series of transactions and roles. Sometimes those activities lead to a product, and other times they lead to a service. In both cases, there are ways of simplifying and even automating business activities as we begin to integrate emerging technologies. Can smart contracts and autonomous code replace or augment our organizations and businesses in new ways? This topic also opens up major questions about ethics and governance – who builds these tools, and what happens when things go wrong?

Build (in class): Design Review and Preparation for Building an MVP

- Students will present their sketchwork and solicit feedback
- We will begin to review what a Minimum Viable Product is and how to prepare for the upcoming week.

Assignments for Next Session: Building an MVP

1. Building your project MVP for the remaining weeks.

Now that you have identified the big idea, your target industry, your target market, the problem you are attempting to solve, and some general ideas on what you should build in order to solve the problem and test your hypothesis (including a testing framework to improve your hypothesis over time), it's time to get your hands dirty. You will have the remaining weeks to build a minimum viable product (however you see fit), a 10-15 slide

venture pitch deck supporting your overall idea, and prepare for a demo competition at the end of the semester.

1. To be a successful entrepreneur, you need to be both relentless and resourceful in your ways. Feel free to tap peers, friends, relatives, potential co-founders, teachers; any means necessary to get to your end goal of building a minimum viable product.
2. Don't forget to build the business case while you build the product idea. Your pitch to prospective investors is as important as the product is, if not more important. Winning capital commitments with effective storytelling will only get you further down the road to bringing your story to life and further validating your hypothesis.
3. Create a venture pitch deck of 10-15 slides that shows a business case for your idea
4. Create a 12 minute demo moment for pitching your idea in a competition
5. Present to your peers and others on the last day of class.
6. Through the use of UI Kits, coding skills, clickable mockups tools (invision / figma), design tools, and etc. Create a minimum viable product.

2. Continue working on your Research Brief.

Week 12 | Friday, November 13: Blockchain Governance - Social & Technical Power

Location: **Online**

Learning Objectives:

- Discuss some of the hurdles in the governance of blockchains both on-chain and off-chain
- Discuss the risks inherent in these systems, and how different networks approach them
- Introduce how private and public networks try to address this

Pre-reading Resources:

Pre-read Topic	Pre-read Materials
Lecture	Video: Governance in Web2 vs. Governance in Web3 - Vlad Zamfir Web Summit 2018 Video: Vitalik Buterin Discusses On-Chain Governance Extra (Article): Blockchain Communities and Their Emergent Governance Extra (Article): Why on-chain governance? Extra (Article): Blockchain Governance 101 Extra (Article): Citizenship in the Era of Blockchain-Based Virtual Nations Extra (Article): Blockchain Governance: Programming Our Future Extra (Article): My Intentions for Blockchain Governance
Build	Chapter 12: *The Lean Startup*

Lecture (Teachable): Blockchain Governance – Social & Technical Power

While blockchain enables many new efficiencies by creating shared reality, it also comes with governance and security hurdles. How do these systems get maintained, updated, and/or forked going forward? Where can math and cryptography substitute for human collaboration and coordination and where do they represent a poor fit? How are companies that leverage this technology dealing with governance challenges amongst themselves as they manage a shared non-competitive technological resource?

Build (in class): MVP Review and Preparation for Next Class

- Students will present current product plan and tweaks made.
- We will discuss continued iteration in preparation for the next week

Assignments for Next Session:

1. Iterating on your design.

Iteration is key to improving your gathered requirements, and user feedback is key to iteration. During this week, you will spend some time with your stakeholders reviewing your minimal viable requirements presented in the previous week. Afterwards, you will gather key and critical feedback from these stakeholders. From there, you will reevaluate your requirements, and make any necessary changes.

- Review your minimal viable requirements with key stakeholders and iterate to improve.
- Modify your slides from the previous week, and be prepared to share your learnings with the class during our upcoming class.

2. Submit a draft of your Research Brief for review and feedback. Be sure to draft it as fully as you can, in order to receive the most helpful feedback before final submission.

Week 13 | Friday, November 20: CAPSTONE REHEARSALS / Regulation in the Decentralized Economy

Location: **Online**

Learning Objectives:

- Discuss some of the hurdles in the regulation of blockchain and decentralized computing
- Introduce the battle surrounding delinking money from the nation state
- Introduce the concept of compliance innovation

Pre-reading Resources:

Pre-read Topic	**Pre-read Materials**
Lecture	Extra (Video): Cato Institute: The 26 Words That Created The Internet Extra (Article): 2018 Speech by Christine Lagarde on Central Banks and Digital Currency Extra (Article): Casting Light on Central Bank Digital Currency Extra (Article): Crypto Regulation Outlook in 2019 - What Is the Global Scenario? Extra (Podcast): Episode 9: Pia mancini and Tom Serres Envision A Democracy Fit for the 21st Century
Build	Chapter 13: *The Lean Startup*

Lecture (Teachable): Regulation in the Decentralized Economy

The idea that blockchain, and the computing stack it spawns, is largely unregulated today causes both panic and intrigue. On the one hand, enterprises prefer to see regulatory clarity around technologies before moving into full-scale adoption, in order to

counter risk. On the other hand, much of the green territory opening up in the decentralized economy is already there for the taking – and early innovators know there is benefit to capturing value today since law is usually a lagging indicator compared to social adoption (e.g. think how quickly Airbnb or Uber were adopted before regulators started to catch up). In this session, we will explore some of the major regulatory challenges and draw insights from previous legal battles over open technological playing fields.

Build (in class):

** Due to the Fall calendar (only 14 sessions instead of 15) we will use this week for Capstone Rehearsals in class as well as covering the Lecture content.*

- MVP Review
- Student feedback

Assignments for Next Session:

1. Building your project MVP for the remaining weeks
2. Polishing your Big Idea Research Brief.
3. Remember, final versions of Pitch Decks and Research Briefs are due EOD on the final day of class.

** November 27 – THANKSGIVING BREAK – NO CLASS*

Week 14 | Friday, December 4: Capstone Presentations

Location: **Online**

Pre-reading Resources:

Pre-read Topic	**Pre-read Materials**
Lecture	None
Build	None

Lecture (Teachable): None

Build (in class): Venture Pitching (2hours)

- Students will each have a chance to pitch their project and receive meaningful feedback as well as some winning prizes.
- Peer assessments will take place as will guest judging.
- **Pitch decks and final Big Idea Research Briefs should be submitted by EOD.**