

MBA 694: Blockchain and Cryptocurrency

February 4-6, 2022

Class TBD. Fri: 6:00 pm – 9:00 pm. Sat: 8:00am – 5:00 pm. Sun: 8:00 am – 12:00pm

Instructor Bio

Hello class, my name is Sebastian Stan and I currently work for Northrop Grumman as a Mechanical Engineer. I hold a B.S. in Aerospace Engineering with a minor in Language and Culture, a M.S. in Engineering Management, and I am currently working on a M.S. in Information Security and Assurance. My background is mainly in aircraft subsystems, testing, and manufacturing, having worked on a number of leading programs in the nation. Throughout my career I have worked to integrate new technologies and expand the capabilities of model-based engineering applications. This has led me to work with a number of computer programming languages and drove me to get another degree in cybersecurity. Expanding into blockchains was a natural step of development in a number of aspects of my career and I have always kept an eye on the latest developments in blockchain for both financial opportunities as well as technical ones. I am looking forward to teaching this course and adding to the general understanding of this new, highly innovative, and rapidly developing subject.

Course Description

This course provides an overview of blockchain technology: What it is, why it is unique, and how it is being applied to fields such as business, finance, and entertainment. We'll explore the foundations of blockchain, cryptography, cryptocurrency, information security, and various blockchain applications. This course will explain the benefits and power of blockchain while also highlighting drawbacks and considerations that must be made when applying this new technology to business applications.

Readings

Investopedia: Blockchain Explained, <https://www.investopedia.com/terms/b/blockchain.asp>
- and/or(ish) –

YouTube: How does a blockchain work, https://youtu.be/SSo_ElwHSd4

KeyFactor: What is PKI and How Does it Work? <https://www.keyfactor.com/resources/what-is-pki/>
- and/or –

YouTube: Public Key Cryptography (short version), <https://youtu.be/3QnD2c4Xovk>

ConsenSys: Blockchain Use Cases and Applications by Industry, <https://consensys.net/blockchain-use-cases/>

Coinbase: What is mining? <https://www.coinbase.com/learn/crypto-basics/what-is-mining>

Optional reading materials:

Understanding Web 3 — A User Controlled Internet, <https://blog.coinbase.com/understanding-web-3-a-user-controlled-internet-a39c21cf83f3>

Coinbase: DAOs: Social networks that can rewire the world, <https://www.coinbase.com/learn/market-updates/around-the-block-issue-21>

Coinbase: 7 biggest Bitcoin myths, <https://www.coinbase.com/learn/crypto-basics/7-biggest-bitcoin-myths>

Coinbase: What is a non-fungible token (NFT)?, <https://www.coinbase.com/learn/crypto-basics/what-are-nfts>

Grading

Individual Assignment: Blockchain business application	25%
Team Assignment: Business blockchain network presentation	40%
Individual Assignment: Blockchain business application reflection	20%
Class participation	15%

(A above 92%; A -: 90-92%; B+: 88%-90%; B: 82-88%; etc, hopefully N/A)

Course Schedule (times may change; it will be adapted to the class needs)

Friday:

6:00 PM-9:00 PM Course introduction; blockchain and cryptocurrency overview
Encryption and private/public key infrastructure overview
Team Project: Organize teams
Present example business blockchain options for Team Project

Saturday:

08:00 AM-10:00 AM Web 3.0, blockchains, data history, and smart contracts
Cryptocurrencies (Primary blockchains, coins, DAOs, user-facing interface, etc.)
10:00 AM-10:30 AM **Team Project: Select business blockchains and analyze applications**
10:30 AM-12:00 PM Blockchain network expansion and business beyond cryptocurrency
Blockchain in financial transactions
Blockchain in intellectual property licenses and entertainment
Blockchain in supply chains (tracking, anti-counterfeit, automated systems)
12:00 PM-1:00 PM Lunch
1:00 PM-3:00 PM Blockchain in business operations
Team Project: Begin development of business blockchain network model
3:00 PM-4:00 PM Cybersecurity, threats to blockchain, and threats to cryptocurrency
Computational and environmental costs of blockchains
Risk assessments, HRI (hazard risk index), cybersecurity assessment models
4:00 PM-5:00 PM **Team Project: Continue to develop and refine blockchain network model**
Consider blockchain specific external and internal threat actors

Sunday:

8:00 AM-09:00 AM	Team Project: Finalize business blockchain network models and prepare to present to the class (15 min. presentations)
09:00 AM-11:00 AM	Team Project: Team presentations of business blockchains network models
11:00 AM-12:00 PM	Final discussion, closing thoughts, and course wrap-up

Assignments

Individual Assignment: Blockchain business application: Due at noon, Fri Feb. 4

This assignment involves writing a paper with the following format:

- Include the student's first and last name and assignment descriptor
- Be double spaced
- Have a length of three (3) to four (4) pages (no need for cover sheet or citations)

The purpose of this exercise is to develop a high-level understanding of blockchain and its possible applications. Specifically, this assignment will begin to bridge business with the new blockchain technology and form a foundation for the course to expand and build on. For this assignment, you shall:

1. Choose a business that:
 - Involves keeping records or transactions
 - Requires accuracy and irrefutability of records
 - Requires some level of confidentiality or protection of information (should be all businesses)
2. Based on course readings/videos, consider the application of a blockchain to the selected business to:
 - Record transaction history
 - Adds value by providing a trustworthy history
 - Protects customer and business information
 - Enhances business operations value

This assignment should include a brief explanation on the business selected and the needs of the business based on the criteria listed in item 1. This assignment should then include an application of blockchain to fit the business needs (such as the ones listed under item 2) based on the understanding gained from the readings as well as other knowledge and experience.

Team Assignment: Business blockchain network presentation: Due Sun. Feb. 6

The purpose of this assignment is to build on the previous Individual Assignment and apply the content learned in the course to further develop blockchain concepts. This assignment will be done as a team to allow for the development of different blockchain aspects for each business applications including:

- More developed business application
- Type of network used (e.g., internal blockchain vs. trusted external peer network, etc.)
- Development of blockchain and mining of "tokens" in the chain (e.g., internally mined and developed vs. partnership existing cryptocurrency network)
- The type, size, and distribution of the blockchain network

- Security of the blockchain application (cybersecurity, market factors, etc.)

Each group shall create and present a 15 min. PowerPoint presentation (or equivalent) to the class on Sunday. The business application can be determined by the team however it is recommended that it follows the same criteria as the ones listed in item 1 in the previous individual assignment. This presentation should be tailored to most effectively apply to the selected business application with consideration given to its unique needs. The overall goal of this assignment is to communicate the benefits and opportunities blockchains bring while also highlighting costs, limitations, and vulnerabilities they bring to businesses.

Individual Assignment: Blockchain business application reflection: Due Sun. Feb. 13

The purpose of this assignment is to reflect on the content of the course and develop on the previous individual assignment with the newfound knowledge gained from the course and from the perspectives of other students. There are no specific requirements to the content however consider the application of blockchain in the first individual assignment and consider this application given the new knowledge. Things to consider can include: Would this application of blockchain be changed, appended, or reconsidered entirely? What appears to be the most important consideration that needs to be made when working with or applying a blockchain?

The format requirements for this assignment shall:

- Include the student's first and last name and assignment descriptor
- Be double spaced
- Have a length of two (2) to three (3) pages (no need for cover sheet or citations)

Note: All assignments are to be submitted by the listed deadlines in Moodle. Late submissions are NOT accepted. All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code: <https://www.business.umt.edu/ethics/professional-conduct-code.php>. It is the student's responsibility to be familiar with the Student Conduct Code.

Disability Accommodations:

Students with disabilities will receive reasonable accommodations in this course. To request course modifications, please contact me within the first two days of class. I will work with you and Disability Services in the accommodation process. For more information, visit the Disability Services website at <http://www.umt.edu/dss/> or call 406.243.2243 (Voice/Text).

Mission Statements and Assurance of Learning

The College of Business at the University of Montana creates transformative, integrated, and student-centric learning experiences, propelling our students to make immediate and sustained impact on business and society. We nurture our students' innate work ethic to develop confident problem solvers and ethical decision makers. We pursue thought leadership and collectively create opportunities for a better life for our students, faculty, and staff.

COB Core Values:

- Students first: We educate the whole person
- Experiential learning: We create experiences that matter
- Thought leadership: We create rigorous and relevant knowledge
- Stewardship: We value people, planet and profit

The University of Montana MBA Program's mission is to serve our region by educating leaders to effectively manage organizations in a global business environment. As part of our assessment process and assurance-of-learning standards, the MBA program has adopted six learning goals for our students. MBA graduates will demonstrate...

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1. Integrated knowledge of business functions.
2. Communication skills and teamwork ability.
3. Ethical conduct, social responsibility, and professional leadership.
4. Analytical and innovative thinking in business problem solving.
5. Knowledge and application of current trends in information technology.
6. Ability to evaluate implications of operating in the global business environment.