School of Computing and Information Sciences

Course Title: Introduction to Crypto-currencies **Date:** 11/18/2019

Course Number: IDC-2XXX

Number of Credits: 3

Subject Area: Computer Information Systems	**Subject Area Coordinator:** Jason Liu **email:** liux@cis.fiu.edu
Catalog Description: High-level conceptual survey of crypto-currencies and other blockchain technologies for non-CS undergraduates, including techniques, applications, ethics and philosophical issues.	
Textbook: Andreas M. Antonopoulos, The Internet of Money: A collection of talks by Andreas M. Antonopoulos 1st Edition CreateSpace, 2016. ISBN: 978-1537000459	
References: None	
Prerequisites Courses: MAC-XXXX or MAD-XXXX or MGF-XXXX (any math course at any level)	
Corequisite Courses: None	

Type: Elective for Non-CS Majors

Prerequisites Topics:

Pre-college mathematics: functions and algebra

Course Outcomes:

1. Be familiar with crypto-currency technologies
2. Describe a selection of fundamental concepts, methods, and models used in crypto-currency and blockchain technologies
3. Explain the basic philosophical and ethical positions and concerns currently at play in the field
4. Be familiar with the principles of cryptocurrencies in online transactions and smart contracts
5. Be exposed to how blockchain can enhance security and privacy of computer systems.

Outline

Topic	Number of Lecture Hours (Total: 37.5 hours = 15 weeks * 2 lectures/week * 1.25 hrs/lecture)	Outcome
Overview of Cryptocurrencies • What is the benefit of cryptocurrencies? • Science-side vs. economy-side cryptocurrencies • CS modeling vs. business applications	5	1,2
Philosophical Issues • What is the definition of crypto-currency? • How can we determine if a crypto-currency is valuable? • How can we rank cryptocurrencies?	7	1,3
Ethical & Social Issues • Can cryptocurrency transactions be immoral? • Can cryptocurrency transactions be unethical? • What are the implications of cryptocurrency for privacy? • What are the implications of cryptocurrency for the stock market? • What are the implications of cryptocurrency for private companies? • What are the implications of cryptocurrency for society?	5.5	1,3,5
Introduction to Blockchain • Peer to peer networks • Cryptography • Digital Signature • Nodes • Hashing	10	2
Security Issues of Cryptocurrencies • Hackers and cyber-attacks • Vulnerable wallets • Selfish mining • Double Spending • 51 percent attack	10	2,5

Course Outcomes Emphasized in Laboratory Projects / Assignments

Outcome	Number of Weeks
Essay assignment addressing philosophical and ethical issues	4
Homework problems addressing overview of cryptocurrencies	2
Homework problems addressing cryptography and digital signatures	2
Homework problems addressing p2p networks, nodes and hashing	2
Homework problems addressing security issues of cryptocurrencies	4

Oral and Written Communications

Written Reports		Oral Presentations	
Number Required	Approx. Number of pages	Number Required	Approx. Time for each
1	5	0	0

Social and Ethical Implications of Computing Topics

Topic	Class time	Student Performance Measures
Definition of cryptocurrencies	2	Essay, free-answer questions on exams.
cryptocurrencies & ethics	2	Essay, free-answer questions on exams.
cryptocurrencies & social impact	2	Essay, free-answer questions on exams.

Approximate Number of Credit Hours Devoted to Fundamental CS Topics[1]

Fundamental CS Area	Core Hours	Advanced Hours
CN – Computational Science		0.5
DS – Discrete Structures		1
IS – Intelligent Systems		0.5
SP – Social Issues and Professional Practice		1

Theoretical Contents

Topic	Class time
n/a	

Problem Analysis Experiences

None

Solution Design Experiences

None

[1] See Appendix A in *Computer Science Curricula 2013.* Final Report of the IEEE and ACM Joint Task Force, available at: https://www.acm.org/binaries/content/assets/education/cs2013_web_final.pdf