IS3101: BLOCKCHAIN AND DIGITAL CURRENCY

Effective Term
Semester B 2024/25

Part I Course Overview

Course Title
Blockchain and Digital Currency

Subject Code
IS - Information Systems
Course Number
3101

Academic Unit
Information Systems (IS)

College/School
College of Business (CB)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
CB2500 Information Management and one programming course (either IS3230 Java Programming for Business or IS2240 Python Programming for Business or CB2240 Introduction to Business Programming in Python)

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

The course will cover digital currencies (e.g., Bitcoin, Ethereum), blockchain technologies, distributed ledger technology, and their applications, implementation and security concerns. Students will learn how these systems work; analyse the security and regulation issues relating to blockchain technologies; and understand the impact of blockchain technologies on financial services and other industries. In addition, students also get hands-on learning opportunities to develop decentralized applications related with digital currency and blockchain.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Analyse the concepts related with digital currency, blockchain, and smart contract technologies.	20	x		
2	Analyse the application and impact of blockchain technology in the financial domain and other markets.	30	x	x	
3	Reflect security issues related to blockchain and its business applications.	25	x	x	
4	Formulate smart contracts for blockchain to address business pain points.	25		x	x

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	LTA1: Lectures	Students will engage in lectures covering concepts, frameworks and technologies related to smart contracts, digital currency and blockchain.	1, 3	Seminar:3 Hours/Week
2	LTA2: Cases studies	Students will analyze how smart contracts and blockchain technology are used in different industries and evaluate their impact on businesses.	1, 2, 3, 4	Seminar:3 Hours/Week

3	LTA3 : Online discussion	Students will discuss, clarify, and debate key concepts, techniques, and methods through peer interactions.	2, 3, 4	Seminar:3 Hours/Week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	AT1:Participation Students will participate in class activities such as small group discussions and presentations, self-reflection, raising and answering questions. Class participation is used to assess students' understanding of the topics and their abilities to apply the knowledge and concepts taught in class.	1, 2, 3, 4	20	
2	AT2:Individual Assignments Students will answer questions and solve problems in the area of blockchain technologies and applications.	1, 2, 3, 4	10	
3	AT3:Group Project Students will work in groups to consolidate their learning by solving a specific business problem using the concepts and tools learned in the course through hands-on experiences. Each team will be required to submit a project report and give a presentation to demonstrate the applications they have developed.	1, 2, 3, 4	30	

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

2

Assessment Rubrics (AR)

Assessment Task
AT1: Participation

Criterion
Ability to accurately explain the concepts related with cryptocurrency, blockchain, and distributed ledger technologies.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
AT1: Participation

Criterion
Ability to accurately analyse the application and impact of blockchain technology in the financial domain and other markets.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
AT1: Participation

Criterion
Ability to accurately assess security issues related with cryptocurrency and blockchain.

Excellent (A+, A, A-)

High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
AT1: Participation

Criterion
Capability to effectively apply blockchain technology and develop business applications related with cryptocurrency and blockchain.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
AT2: Individual Assignments

Criterion
Ability to demonstrate understanding of the course topics through assignments.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)

Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
AT2: Individual Assignments

Criterion
Ability to accurately analyse the application and impact of blockchain technology in the financial domain and other markets.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
AT2: Individual Assignments

Criterion
Ability to accurately assess security issues related with cryptocurrency and blockchain.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
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Assessment Task
AT2: Individual Assignments

Criterion

Capability to effectively apply blockchain technology and develop business applications related with cryptocurrency and blockchain.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT3:Group Project

Criterion

Ability to demonstrate understanding of the course topics through assignments.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT3:Group Project

Criterion

Ability to accurately analyse the application and impact of blockchain technology in the financial domain and other markets.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT3:Group Project

Criterion

Ability to accurately assess security issues related with cryptocurrency and blockchain.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT3:Group Project

Criterion

Capability to effectively apply blockchain technology and develop business applications related with cryptocurrency and blockchain.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT4. Final Examination

Criterion

Ability to critically explain and evaluate the blockchain and cryptocurrency eco-systems and its underlining technologies, i.e., Solidity, Smart contract & Dapps.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT4. Final Examination

Criterion

Ability to accurately analyse the application and impact of blockchain technology in the financial domain and other markets.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT4. Final Examination

Criterion

Ability to accurately assess security issues related with cryptocurrency and blockchain.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT4. Final Examination

Criterion

Capability to effectively apply blockchain technology and develop business applications related with cryptocurrency and blockchain.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Cryptocurrencies; Bitcoin; Blockchain technology; Smart contracts; Data blocks; Internet of money; Decentralization; Peer-to-peer network; Distributed ledger; Security; Privacy; Regulation; Banking; Financial services; Decentralized Applications; New business models; Entrepreneurship; Programming and Application Development.

Reading List

Compulsory Readings

	Title
1	Andreas M. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies, O'Reilly Media, 1st edition, December 20, 2014.
2	Arshdeep Bahga, Vijay Madisetti, Blockchain Applications: A Hands-On Approach, VPT, 1st edition, January 31, 2017.

Additional Readings

	Title
1	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press, July 19, 2016.
2	William Mougayar, The Buisness Blockchain: Promise, Practice, and Application of the Next Internet Technology, Wiley, 1st edition, May 9, 2016.
3	Don Tapscott, Alex Tapscott, Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World, Portfolio / Penguin, May 10, 2016.
4	Narayan Prusty, Building Blockchain Projects: Building decentralized Blockchain applications with Ethereum and Solidity, Packt Publishing, April 27, 2017.