

Course Specification of Blockchain

Course No (.....)

2020/2021

lead of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Academic Development center and Quality
r. Ahmed Al-shalabi	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad
		Rector of Sana'a University	
			Prof. Dr. Qassim Mohammed Abbas



I. C	I. Course Identification and General Information:					
1	Course Title:	Block	cchain			
2	Course Code & Number:					
			C.I	н		TOTAL
3	Credit hours:	Th.	Seminar	Pr	Tr.	
		3	-	-	-	3
4	Study level/ semester at which this course is offered:	3 th le	vel-1 st sem	iester		
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	CS				
8	Language of teaching the course:	Engli	sh/Arabic			
9	Study System	Term	based syst	em		
10	Mode of delivery:	Full 7	Гime			
11	Location of teaching the course:	Facul Techi	ty of Con nology	nputer a	ind Info	ormation
12	Prepared By:	Dr.Gł	hale Al-Gag	phari		
13	Date of Approval					

lead of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Academic Development center and Quality
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II. Course Description:

This course provides a comprehensive overview of what blockchain is and how it works. It explores the transition from the accounting traditional ledger to a distributed one and describes how transactions occur under this new paradigm. Insights on how blockchain affect the future of industry and organizations also are covered. The course also covers aspects related to automation of assurance procedures and provides some concepts to develop a blockchain system. Finally, an introduction to the concept of the digitalization of assets and related contract automation which leads to Hashing, Cryptography,Smart Contracts are discussed. The mission of this course is to introduce concepts, algorithms and tools to understand the potential of blockchain technology in real world applications.

	Course Intended learning outcomes (CILOs) of the course	Referenced PILOs (Onl write code number of referenced Program Intended learning outcomes)
a.1	Define what a blockchain system is and describe its working principles.	A1, A6
a.2	Describe the differences between a classical ledger and a distributed one.	
b.1	Analyze the transaction and its regulation in a blockchain.	B4, B6
b.2	Design a well-structured encryption scheme in the context of blockchain.	
c.1	Design a workflow for transitioning to mining rewords dominated by transaction fees.	C1,C2
c.2	Implement encryption scheme in the context of blockchain for security enhancement.	C2
d.1	Design, code and evaluate a simple working example which can solve a real-world case.	D1, D6
d.2	Work with peers within a group project.	

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				Rector of Sana'a University
		Prof. Dr. Qassim Mohammed Abbas		



(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies	
a1. Define what a blockchain system is and describe its working principles.	Lectures Debate Cooperative learning Brain storming Practical proof	Written Exam year work to assess mental and general skills, knowledge and understanding.	
a2. Describe the differences between a classical ledger and a distributed one.	Lectures Debate Cooperative learning Brain storming Practical proof	Written Exam Year work to assess mental and general skills, knowledge and understanding	

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b 1. Analyze the transaction and its regulation in a blockchain.	Lectures Debate Cooperative learning Brain storming Practical proof	Year work to assess mental and general skills, knowledge and understanding
b2. Design a well-structured encryption scheme in the context of blockchain.	Lectures Debate Cooperative learning Brain storming	Year work to assess mental and general skills, knowledge and understanding

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Practical proof	

(C) Alignment Course Intended Learnin Teaching Strategies and Assessment Str	ng Outcomes of Professio rategies:	nal and Practical Skills to
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Design a workflow for transitioning to mining rewords dominated by transaction fees.	Lectures Debate Cooperative learning Brain storming Practical proof	Practical exam to evaluate practical professional skills.
C2. Design a workflow for transitioning to mining rewords dominated by transaction fees.	Lectures Debate Cooperative learning Brain storming Practical proof	Practical exam to evaluate practical professional skills.

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies	
d1- Design, code and evaluate a simple working example which can solve a real-world case.	Lectures Exercises Practical exercises Use modern references Access to scientific research Use libraries and the Internet	Exam Quizzes Homework	
d2- Work with peers within a group project.	Lectures Exercises	Exam Quizzes	

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Practical exercises	Homework
Use modern references Access to scientific research Use libraries and the Internet	

IV. Course Content:						
	A – Theoretical Aspect:					
Orde r	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	conta ct hours	

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	Assurance		Quality
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	1	Blockchain Introduction	a1, c2, b1, d1, a2	 Blockchain Technology Blockchain Programming for record financial transaction in today time Distributed Ledgers used in Blockchain Technology. Blockchain platform and digital database. 	1 week	2	
	2	Evolution of Blockchain and web decentralizati on	a1, d1, b1, c2, b2	 blockchain platform development and future financial economics. The Decentralized Web connecting data analytics and Internet of Things based on web decentralization. 	2 weeks	4	
	3	Distributed Organization & ledger	a1,b1,a2, b2,c1,d1,c2	 creating a new network for the Distributed Organization based on blockchain technology. 	2 weeks		
lead of Department	Vis	e Dean for Qualit	y Dean of t	he Faculty Dean of Academ	ic Developme	nt center a	ind

r. Ahmed Al-shalabi

Assurance Dr. Anwar Al-Shamiri Dr. Nagi A

Dr. Nagi Al-Shibani

n of Academic Development center a Quality Assoc. Prof. Dr.Huda Al.Emad

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r. Ahmed Al-shalabi	Dr	. Anwar Al-Shamir	i Dr. Nagi	Al-Shiban	ni Assoc. Pro	of. Dr.Huda Al	.Emad a'a Univers	sity
lead of Department	Vis	se Dean for Qualit Assurance	y Dean of t	he Facult	y Dean of Academ	ic Developme Quality	nt center a	nd
	6	Internet of Value & Token Economies & Decentralized Autonomous Organizations	a1, a2, b1, b2, d1	• 2 0 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Autonomous Organizations. exchange values in Blockchain on Internet using Secure Platform Internet Values Exchange. facilitating digital exchange in Blockchain transforming digital currency and data inputs by trusting each	2 weeks	4	
	4	Smart Contracts & Distributed Application	a1,b1,a2, b2,c1,d1,c2	 s t t	smart contracts in the blockchain. secured digital transformation. werification of transformation. running different applications in Blockchain. Consensus Algorithms	2 weeks	4	
				• N I I I I I I I I I	What Distributed Ledgers in Blockchain? now various ransactions are updated by the Distributed Ledgers and updated from time to time?		4	
				1				



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					l Prof. Dr	Rector of San r. Qassim Moh	a 'a University ammed Abbas
ead of Department	Vis Dr.	e Dean for Quality Assurance . Anwar Al-Shamir	y Dean of t i Dr. Nagi	he Faculty Al-Shibani	Dean of Academ Assoc. Pro	iic Developme Quality of. Dr.Huda Al	nt center and .Emad
	8	Blockchain & Environment & Blockchain & Society	b2, d1, a2, c1	 bloc tech con soc The dep bloc tech con Blo Tech con Blo Tech con able data Inst pro plat and Inst Tech bein bas 	ckchain nology is nected to the iety. e society is rendent on ckchain nology in the ning days. ockchain chnology is e to share the a among the titutions and vide a secure tform. d know how titutional chnology is ng used on the is of	2 weeks	4
	7	Blockchain and Economy& Blockchain Internet of things&	a1,b1,a2, b2,c1,d1, c2	 Ra Dev the bas Blo tech Inte witt Blo in c and wor 	pid velopment of environment ed on ockchain nnology. ernet of Things hin Blockchain ockchain role connectivity the Internet rld.	3 weeks	6
				oth Tec	er Blockchain chnology		



			Technology.		
Number of Weeks /and Units Per Semester			14	28	

B - Practical Aspect: (if any)							
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes			
1	Introduction to canvas	2 weeks	4	a1,a2			
2	Canvas learning model	2 weeks	4	a1, d1, b1, c2, b2			
3	Onsite Training	1 weeks	4	a1,b1,a2, b2,c1,d1,c2			
4	Custom Training &Virtual Q&A Webinar	3 weeks	4	a1,a2,b2,c1			
6	Blockchain using PL implementation	3 weeks	4	a1,a2, b1, b2,c1,d1, c2			
7	Blockchain as a data structure	1 week	4	b2,d1,a2,c1			
8	Hashing functions and Mapping blocks	2 week	4	a1,b1,a2, b2,c1,d1			
Numb	er of Weeks /and Units Per Semester	14	28				

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V. Teaching strategies of the course:

- Lectures
- Debate
- Cooperative learning
- Brain storming
- Practical proof
- Use modern references
- Access to scientific research
- Use libraries and the Internet

VI. Assignments:						
No	Assignments	Aligned CILOs (symbols)	Week Due	Mark		
1						
2						

VII	VII. Schedule of Assessment Tasks for Students During the Semester:							
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes			
1								
2								
3								
4								

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 Vise Dean for Quality Assurance
 Dean of the Faculty
 Dean of Academic Development center and Quality

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 Assoc. Prof. Dr.Huda Al.Emad

 Rector of Sana'a University





IX	IX. Course Policies:						
Unles Facu	Unless otherwise stated, the normal course administration policies and rules of the Faculty of Computer and Information Technology apply. For the policy, see:						
The U to	University Regulations on academic misconduct will be strictly enforced. Please refer						
1	Class Attendance: A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring a proof statement from university Clinic						
2	Tardy: For late in attending the class, the student will be initially notified. If he repeated lateness in attending class, he will be considered as absent.						
3	Exam Attendance/Punctuality: A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.						

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4	Assignments & Project The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.
5	Cheating: For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.
6	Plagiarism: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proofed a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7	 Other policies: Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy



Faculty of Computer & Information Technology

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Department of Computer Science

Program of Computer Science

Course syllabus of Blockchain

Course No (.....)

2020/2021

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I Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

	II. Course Identification and General Information:					
1	Course Title:	Blockchain				
2	Course Code & Number:					
			C.I	Η		TOTAL
3	Credit hours:	Th.	Seminar	Pr	Tr.	
		2	-	2	-	3
4	Study level/ semester at which this course is offered:	3 rd level -1 st semester				
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	CS				
8	Language of teaching the course:	English/Arabic				
9	Study System	Term based system				
10	Mode of delivery:	Full Time				
11	Location of teaching the course:	Facult Techr	ty of Com nology	puter a	nd Info	rmation

lead of DepartmentVise Dean for Quality
AssuranceDean of the FacultyDean of Academic Development center and
Qualityr. Ahmed Al-shalabiDr. Anwar Al-ShamiriDr. Nagi Al-ShibaniAssoc. Prof. Dr.Huda Al.Emad

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III. Course Description:

This course provides a comprehensive overview of what blockchain is and how it works. It explores the transition from the accounting traditional ledger to a distributed one and describes how transactions occur under this new paradigm. Insights on how blockchain affect the future of industry and organizations also are covered. The course also covers aspects related to automation of assurance procedures and provides some concepts to develop a blockchain system. Finally, an introduction to the concept of the digitalization of assets and related contract automation which leads to Hashing, Cryptography,Smart Contracts are discussed. The mission of this course is to introduce concepts, algorithms and tools to understand the potential of blockchain technology in real world applications.

IV. Intended learning outcomes (ILOs) of the course:

• Brief summary of the knowledge or skill the course is intended to develop:

a1. Define what a blockchain system is and describe its working principles.

a2. Describe the differences between a classical ledger and a distributed one.

b1. Analyze the transaction and its regulation in a blockchain.

b2. Design a well-structured encryption scheme in the context of blockchain

c1. Design a workflow for transitioning to mining rewords dominated by transaction fees.

C2. Design a workflow for transitioning to mining rewords dominated by transaction fee

d1- Design, code and evaluate a simple working example which can solve a real-worl case.

d2- Work with peers within a group project.

v. Course Content:

Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

lead of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Academic Development center and Quality
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			Destan of Canala University

Rector of Sana'a University



Order	Topics List	Week Due	Contac t Hours
1	Blockchain Introduction	1 st	2
2	Evolution of Blockchain and web decentralization	2 nd ,3 rd	4
3	Distributed Organization & ledger	4 th ,5 th	4
4	Mid-term Exam	6 th	2
5	Smart Contracts & Distributed Application	7 th ,8 th	4
6	Internet of Value & Token Economies &Decentralized Autonomous Organizations	9 th ,10 th	4
7	Blockchain and Economy& Blockchain Internet of things&	11 th -13 th	6
8	Blockchain & Environment & Blockchain & Society	14 th ,15 th	4
9	Final Exam	16 th	
N	umber of Weeks /and Units Per Semester	16	32

B – Practical Aspect: (if any)

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Assurance		Quality								
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									R	Rector of Sana'a University
		Prof. Dr. Qassim Mohammed Abbas								
	Vise Dean for Quality Assurance Dr. Anwar Al-Shamiri	Vise Dean for Quality AssuranceDean of the FacultyDr. Anwar Al-ShamiriDr. Nagi Al-Shibani								



Order	Topics List	Week Due	contact hours
1	Introduction to canvas	1 st ,2 nd	4
2	Canvas learning model	3 rd ,4 th	4
3	Onsite Training	5 th ,6 th	4
4	Custom Training & Virtual Q&A Webinar	7 th ,8 th	4
5	Mid Exam	9 th	2
6 Blockchain using PL implementation		10 th ,11 th	4
7	7 Blockchain as a data structure		4
8 Hashing functions and Mapping blocks		14 th ,15 th	4
10 Final Exam		16 th	2
Numbe	er of Weeks /and Units Per Semester	16	32

VI. Teaching strategies of the course:

- Lectures
- Debate
- Cooperative learning
- Brain storming
- Brain storming
- Use modern references
- Access to scientific research
- Use libraries and the Internet

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			Prof. Dr. Qassim Mohammed Abbas



VI	VII. Assignments:					
No	Assignments	Aligned CILOs (symbols)	Week Due	Mark		
1						
2						

VIII	VIII. Schedule of Assessment Tasks for Students During the Semester:					
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment		
1						
2						
3						
4						
5						

IX. Learning Resources:				
• Written in the following order: (Author - Year of publication – Title – Edition – Place publication – Publisher).	of			
1- Required Textbook(s) (maximum two).				
2- Essential References.				
3- Electronic Materials and Web Sites <i>etc</i> .				

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 Lecture notes and assignments my given directly to students using soft or hard copy 	-	Mobile phones are not allowed in class during the examination.
	-	Lecture notes and assignments my given directly to students using soft or hard copy

			اللج
التوقيع	الصــــفة	الاســــم	م.
	نائب عميد الكلية للشوون الأكاديمية	أ.م.د. عبد الماجد الخليدي	١
	نائب عميد مركز التطوير الأكاديمي وضمان الجودة	أ.م.د. احمد مجاهد	۲
	ممثل المركز في الكلية	د. حسين الأشول	٣
	نائب رئيس الجامعة للشؤون الأكاديمية	أ.د. إبراهيم المطاع	£

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