Savitribai Phule Pune University T.Y.B.Sc. (Computer Science) - Sem – V Course Type: SECC – II Course Code : CS-3511 Course Title: Blockchain Technology						
Teaching Scheme 03 Lect / week	No. of Credits 2	Examination Scheme: IE : 15 marks UE: 35 marks				
Prerequisite: Understanding of Object Oriented Knowledge of Python	d Programming Concepts					
 Course Objectives Understand what and why of Explore major components of Learn about Bitcoin, Cryptoc To learn blockchain program Postman. 	blockchain technology. f blockchain. urrency and Ethereum. ming using Python, Flask Web	Framework, and HTTP client				
Course Outcomes On completion of the course, stud 1. Learn the fundamentals of Blockel 2. Learn Blockchain programming 3. Basic knowledge of Smart Contrac Course Contents	lent will be able to– hain Technology. ts and how they function.					
Chapter 1 Introduction	to Blockchain	7 Lect				
 Foundational Computing C Evolution of Blockchain Blockchain Vs Database Essentials of Blockchain (I challenges of blockchain u Types of Networks Layered Architecture of Bl Components of blockchain Cryptography (private and Digital Signature) Consensus Mechanisms Cryptocurrency, Digital Cu Smart Contracts Blockchain use cases 	Concepts (Client-Server syster Blockchain generations, type sage) ockchain Ecosystem public keys, Hashing & urrency Bitcoin and Ethereur	ems vs Peer to Peer Systems) es of blockchain, benefits and m				
Unapter 2 How Blockch	ain Works?	5 Lect				
 Understanding SHA256 Ha Immutable Ledger Distributed P2P Network How Mining Works? (The Byzantine Fault Tolerance Consensus Protocols: Proo Competing Chains Blockchain Demo 	ash NONCE and Cryptographic f of Work, Proof of State, D	e Puzzle) éfense Against Attackers,				

Chapter 3	Smart Contracts	6 Lect					
• Ethereur	Ethereum Network						
• What is	• What is a Smart Contract?						
• Ethereur	• Ethereum Virtual Machine, Ether, Gas						
• DApps							
• Decentra	alized Autonomous Organizations (DAO)						
• Hard and	Hard and Soft Forks						
Initial C	oin Offerings						
Demo or	f Smart Contracts						
Demonstratio	n Programming Assignments:	18 Lect					
Out of 36 lect	ures, 18 are assigned for demonstration. Teacher should give de	monstration					
of various pro	ograms mentioned below in the classroom or in the laboratory	as per their					
convenience.							
Assignment 1	-Demonstration of Blockchain						
https://andersb	rownworth.com/blockchain						
Assignment 2	- Installation of Ganache, Flask and Postman						
Assignment 3	–Write a Simple Python program to create a Block class that						
	contains index, timestamp, and previous hash. Connect the blocks	5					
	to create a Blockchain.						
Assignment 4	-Demo of Remix-Ethereum IDE <u>https://remix.ethereum.org</u> an	d					
Test Networks		•,					
Assignment5–1. Write a Simple Smart Contract for Bank with withdraw and deposit							
Functionality. Assignment $6 - 2$ Write a Smart Contract for storing and retrieving information of Degree							
Certificates.							
Reference Bo	oks:						
Textbook:							
1. Beginnir Bikrama	ig Blockchain : A Beginner's Guide to Building Blockchain Solutions aditya Singhal, Gautam Dhameja, Priyansu Sekhar Panda, Apress Me	By edia					
Reference Book	S:						
2. Masterin	g Blockchain by Imran Bashir, Third Edition, Packt Publication						
5. waterno 4 Satoshi N	e, The Science of the Diockenani Jakamoto, Ritcoin: A Peer-to-Peer Electronic Cash System						
5. Masterin	g Ethereum: Building Smart Contracts and DAPPS. by Andreas Antonopo	oulos. Dr.					
Gavid W	ood, Oreilly Publication						
Reference Web Links							
1. https://w	ww.investopedia.com/terms/b/blockchain.asp						

Savitribai Phule Pune University T.Y.B.Sc. (Computer Science) - Sem - VI Course Type: SECC - IV Course Code: CS - 3611 Course Title : Project							
Teaching Scheme 03 Lect/ week/Batch Batch Size : 20	No. of Credits 2	Examination Scheme IE : 15 marks UE: 35 marks					
Batch Size : 20 UE: 35 marks Project Guidelines: • Students should work in a team of minimum 3 and maximum 4 students. • Students can choose a project topic and implement the same using any language/technology covered in the curriculum so far. The operating environment must be linux. • The student group will work independently throughout the project work including: problem identification, information searching, literature study, design and analysis, implementation, testing, and the final reporting. • Project guide must conduct project presentations (minimum 2) to monitor the progress of the project groups. • At the end of the project, the group should prepare a report which should conform to international academic standards. The report should follow the style in academic journals and books, with clear elements such as: abstract, background, aim, design and implementation, testing, conclusion and full references, Tables and figures should be numbered and referenced to in the report. • The final project presentation with demonstration (UE) will be evaluated by the project guide (appointed by the college) and one external examiner (appointed by the during of the during of the project guide (appointed by the college) and one external examiner (appointed by the project guide (appointed by the college) and one external examiner (appointed by the college)							
Recommended Documentation contents: Abstract Introduction							

• Software/hardware specifications

Outputs and Reports Testing

• Test Plan, Black Box Testing or Data Validation Test Cases, White Box Testing or Functional Validation Test cases and results

Conclusion and Recommendations Future Scope Bibliography and References

Project Related Assignments

Guidelines:

- The project assignments are a compulsory part of the project course and should be carried out by each project group.
- Project assignments are to be given by the guide for continuous internal evaluation.
- The project assignments are to be allotted to each group separately by the project guide on the basis of the implementation technology. A suggested list of assignments is given below.
 - 1. Project Time management: plan (schedule table), Gantt chart, Roles and responsibilities, data collection, Implementation
 - 2. Simple assignments to evaluate choice of technology
 - *3.* Assignments on UI elements in chosen technology
 - 4. Assignments on User interfaces in the project
 - 5. Assignments on event handling in chosen technology
 - 6. Assignments on Data handling in chosen technology
 - 7. Online and offline connectivity
 - 8. Report generation
 - 9. Deployment considerations

10. Test cases

• Each student within the group must work actively and contribute to the assignments, project work and report writing.

Evaluation guidelines:

IA (15 marks)			UE (35 marks)		
First presentation	Second presentation	Assignments	Project Logic/ Presentation	Assignments and Project Documentation	Viva
05	05	05	20	10	05