BCSE327L	SMART CONTRACTS	L	T	P	C
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Pre-requisite	**NIL**	**Syllabus version**			
		1.0			

Course Objectives

1. To understand the Smart Contracts in Blockchain.
2. To learn the tools and programming skills required to generate Smart Contracts.
3. To assess the efficiency of the security issues.

Course Outcomes

After completion of this course, the student shall be able to:

1. Understand the basics and objectives of Smart Contracts in a Blockchain.
2. Evaluate the various functionalities and features in an Ethereum to generate Smart Contracts.
3. Introduce the Solidity language in creation of a Smart Contracts.
4. Incorporate Smart Contracts in decentralized applications.
5. Assess the security issues and effectiveness of a Smart Contracts in real world scenarios.

Module:1	**Fundamentals of Smart Contracts**	**2 hours**
Blockchain Terminologies - Cryptocurrency and Smart Contracts - Understanding the Virtual Machine of a Blockchain - Terminology, concepts and practices in Smart Contracts.		
Module:2	**Ethereum Smart Contracts**	**5 hours**
Definition of Ethereum - Prevalence of the Ethereum blockchain in Smart Contracts development - Ethereum Virtual Machine (EVM) - Instances of working Ethereum Smart Contracts.		
Module:3	**Various Aspects in Application of Smart Contracts**	**5 hours**
Market impact and scientific innovation – Trust - Security, using Merkle Trees - Future-resistance features in Smart Contracts applications - Workflow of developing a Smart Contracts - Execution environments in writing a Smart Contracts.		
Module:4	**Solidity Language Basics**	**4 hours**
Layout of a Solidity Source File - Structure of a contracts - Control structures – Functions - Scoping and declarations.		
Module:5	**Solidity with Contracts**	**4 hours**
Creating contracts - Object-oriented high level language features - Visibility and Getters – Events - Abstract Contracts.		
Module:6	**Decentralized Applications**	**4 hours**
Decentralized Application Architecture - Connecting to the Blockchain and Smart Contracts – Building dApps – Deployment.		
Module:7	**Security Issues**	**4 hours**
Shifting from Trust-in-People to Trust-in-Code - Data permanence - Selective-Obscurity - Security counter measures.		
Module:8	**Contemporary Issues**	**2 hours**
	Total Lecture hours:	**30 hours**

Text Book

1. Gavin Zheng, Longxiang Gao, Liqun Huang, Jian Guan, Ethereum Smart Contracts Development in Solidity, 2021, 1st Edition, Springer Singapore.

Reference Books

1. Dannen, C., Introducing Ethereum and solidity, 2017, (Vol. 318). Berkeley: Springer.
2. Modi, Ritesh, Solidity Programming Essentials: A beginner's guide to build smart contracts for Ethereum and Blockchain, 2018, Packt Publishing Ltd, United Kingdom.
3. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder,

	Bitcoin and cryptocurrency technologies: a comprehensive introduction, 2016, Princeton University Press.		
Mode of Evaluation: CAT / written assignment / Quiz / FAT			
Recommended by Board of Studies	04-03-2022		
Approved by Academic Council	No. 65	Date	17-03-2022