

# International Summer School- Manipal University Jaipur [ISSMUJ]-2023

[Hybrid Mode]



## Course Overview

### Name of Course- **Blockchain Technology: Unlock the Power of Decentralized Technology**

Name of instructor: Dr Ankur Pandey, Ms. Vibha Jain and Mr. Abhishek Bhattacharya

Session: May-July 2023

Language of instruction: English

Number of contact hours: 36

Credit awarded: 03

Pre-requisite: Before diving into blockchain, it's helpful to have a basic understanding of computer science and any programming language.

### Objective of Course/Project:

The objective of this course is to gain a comprehensive understanding of the blockchain technology, its potential applications, and its impact on various industries. This includes understanding of cryptography, consensus mechanisms, smart contracts, and decentralized applications.

### Syllabus:

**Basics - the Why, What and How?** Introduction to Blockchain Technology, Key Characteristics of Blockchain, Understanding Decentralization, Generations of Blockchain, Types of Blockchain, Cryptography, Hashing, Digital Signatures, and Transactions, Lifecycle of a Transaction, Wallets and Keys, Popular Blockchain Networks and Use Cases, Myths

**Intermediary-to-Advance Concepts:** Mining in a Blockchain Network, Consensus Mechanisms, Concepts of Merkle Tree, Merkle Root, Nonce etc., Soft and Hard Forks; Popular Forks in History, Smart Contracts, Solidity and the Ethereum Virtual Machine (EVM), dApps (Decentralized Apps), Decentralized Autonomous Organizations (DAOs) and popular case studies.

**Live, Hands-On:** Types of Wallets, setting up a Wallet, In-class Ether (ETH) transfer [testnet], Smart contract using Solidity, Deployment of contracts on private blockchain and Ethereum testnets with Injected WEB3 across REMIX IDE, setting up and using tools such as Ganache, Truffle, Hardhat, Infura

**Permissioned Networks and Frameworks:** Popular Permissioned Networks and Frameworks i. Quorum ii. Hyperledger iii. Corda

**Use Cases, Applications and Challenges:** Supply Chain Management, Voting, and Healthcare, Future of Blockchain Technology: Challenges and Opportunities

### Objective of Course/Project

Total contact Hours: 36		
1st week:	10 hrs (classes)	2 hrs (self-study/project)
2nd week:	10 hrs (classes)	2 hrs (Mid-term exam/assessment/discussion)
3rd week:	10 hrs (classes)	2 hrs (self-study/project)
4 <sup>th</sup> week:	6 hrs (Classes)	2hrs (End term exam)

**Mode of lectures:** Hybrid mode lecture/videos/case study/ discussion/ workshop/ hands-on

### Course/Project Plan:

Lecture no.	Topic	Lecture mode	Instructor
L: 1-8	Basics - the Why, What and How?	Online	Dr. Ankur Pandey
L: 9-15	Intermediary-to-Advance Concepts	Online	Ms. Vibha Jain
L: 16-25	Live, Hands-On	Online	Mr. Abhishek Bhattacharya
L: 26-30	Permissioned Networks and Frameworks	Online	Mr. Abhishek Bhattacharya
L: 30-36	Use Cases, Applications and Challenges	Online	Ms. Vibha Jain

### Brief profile of the instructor



**Dr. Ankur Pandey**  
Assistant Professor  
Manipal University Jaipur



**Ms. Vibha Jain**  
Assistant Professor  
Manipal University Jaipur



**Mr. Abhishek Bhattacharya**  
Subject Matter Expert:Blockchain