

**Year: B. Tech III (Semester V)**

**Subject Name:** Smart Contracts and Solidity

**Subject Code:** BTEA19555

**Type of course:** Minor (Group: Blockchain Technology)

**Teaching and Examination Scheme:**

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	2	4	60	25	15	30	20	150

CA1: Continuous Assessment (assignments / projects / open book tests / closed book tests) CA2: Sincerity in attending classes / class tests / timely submissions of assignments / self-learning attitude / solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work / Quality of work submitted / Active participation in lab sessions / viva on practical skills learned in course.

**Contents:**

Sr. No.	Contents	Total Hours
1.	<b>Smart Contracts:</b> Definition and Need, Features of Smart Contracts, Life Cycle of a Smart Contract, Introduction to Ethereum Higher-Level Languages.	08
2.	<b>Development Environment:</b> Building A Simple Smart Contract with Solidity, Solc-Compiler, Ethereum Contract ABI, Remix-IDE for Smart Contract Development.	09
3.	<b>Introduction to Solidity:</b> Contracts, Constructors & Functions, Variables, Getters & Setters, Arrays, Memory vs Storage, Mappings in Solidity <b>Advanced Solidity:</b> Structs, Error Handling & Restrictions, Libraries, Global Variables in Solidity, Abstract Contracts, Inheritance, And Interfaces, Events	10
4.	<b>Truffle Framework &amp; Ganache:</b> Environment Setup for Truffle & Ganache, Truffle Project Creation, Truffle Compile, Migrate and Create Commands.	09
5.	<b>Decentralized App Creation:</b> Smart Contract Creation, Front-End Creation, Connecting Smart Contract with Front-End Application, Deploying Dapp, Validation, And Testing of Dapp.	09

**Suggested Specification table with Marks (Theory): (For B. Tech only)**

Distribution of Theory Marks	



R Level 20	U Level 20	A Level 15	N Level 5	E Level -	C Level -
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Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (Revised Bloom's Taxonomy)

**Reference Books:**

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN
1	Blockchain for Dummies	Tiana Laurence	John Wiley & Sons
2	Building Blockchain Projects	Narayan Prusty	Packt Publishing
3	Mastering Ethereum: Building Smart Contracts and Dap	Andreas Antonopoulos and Gavin Wood	Shroff Publisher/O'Reilly Publisher

**Note: Students should refer to the latest editions of books**

**Course Outcomes (CO):**

Sr. No.	CO statements	Marks % weightage
CO-1	Explain the working and importance of smart contracts.	40%
CO-2	Implement solidity language required for coding Ethereum smart contracts.	40%
CO-3	Create and deploy a DApp on an Ethereum test network.	20%

**List of Open learning website:**

1. <https://www.coursera.org/learn/smarter-contracts>
2. <https://www.udemy.com/course/solidity-smart-contracts-build-dapps-in-ethereum-blockchain/>
3. Introduction to Blockchain Technology and Applications, [https://swayam.gov.in/nd1\\_noc20\\_cs01/preview](https://swayam.gov.in/nd1_noc20_cs01/preview)

**Lab Work:**

- Experiments will be based on the classroom discussion

