

L07: Decentralized Finance (DeFi)

BSc Blockchain Course

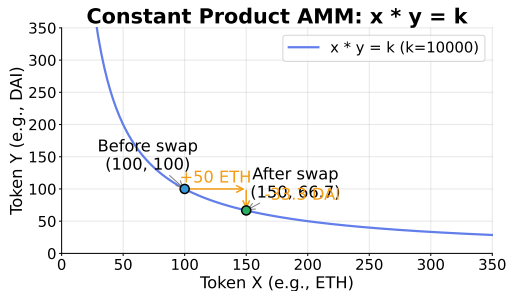
Digital Finance

2026

By the end of this lesson, you will be able to:

- 1 Explain automated market maker (AMM) mechanics
- 2 Understand liquidity provision and impermanent loss
- 3 Describe lending protocols and liquidation mechanics
- 4 Analyze yield farming strategies and risks
- 5 Evaluate the DeFi ecosystem and composability

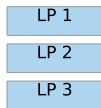
DeFi rebuilds traditional finance on permissionless rails.



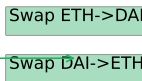
*Constant product formula: $x * y = k$ determines price.*

Liquidity Pool Mechanics

Liquidity Providers



Traders



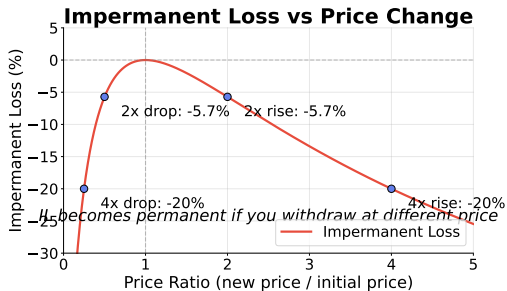
Receive LP Tokens

(share of pool)

Fees collected -> distributed to LPs proportionally

LPs earn fees; traders get instant swaps.

Impermanent Loss



Price divergence creates IL; fees may or may not compensate.

DeFi Lending Protocol Mechanics



Key Parameters:

- Collateral Factor: 80% (can borrow 80% of collateral value)
- Health Factor < 1 triggers liquidation
- Borrow APY: 5% (paid by borrower)

Over-collateralized loans; health factor determines liquidation.

DeFi Yield Strategies Comparison

Strategy	APY	Risk
Staking ETH	3.05%	Low
Lending on Aave	2.4%	Low
LP Fees on Uniswap	5.2%	Medium
Yield Tokens	10-15%	High
Leveraged Returns	20-50%	Very High

Higher APY = Higher Risk (smart contract, IL, liquidation, token devaluation)

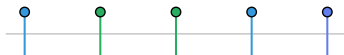
Higher APY = higher risk. Always DYOR.

Flash Loan: Uncollateralized Atomic Borrowing

All within ONE transaction (atomic)



Borrow Arbitrage Profit Repay Keep Profit



\$10M USD from Aave Buy cheap on DEX A Sell high on DEX B \$10M + fee back to Aave Net gain (atomic!)

No collateral needed - if repayment fails, entire tx reverts
Used for: arbitrage, collateral swaps, self-liquidation, attacks

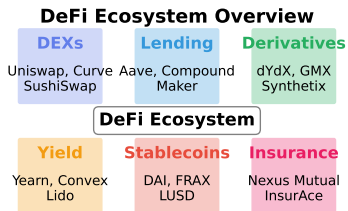
Borrow millions with zero collateral – if repaid atomically.

DEX vs CEX Comparison

Feature	DEX (Uniswap)	CEX (Binance)
Custody	Self-custody	Exchange holds
KYC	None	Required
Speed	Slower (on-chain)	Faster (off-chain)
Liquidity	Growing	High
Fees	0.3% swap	Maker/taker
Security	Smart contracts	Counterparty risk

DEX: "Not your keys, not your coins" | CEX: Better UX, more features

Trade-off: self-custody vs convenience.



Composability: "Money Legos" - protocols can be combined

Composability: protocols can be stacked like Legos.

Remember These Points

- 1 AMMs use $x*y=k$ formula for pricing
- 2 Impermanent loss occurs when prices diverge
- 3 Lending requires over-collateralization
- 4 Flash loans enable atomic, uncollateralized borrowing
- 5 DeFi is composable – protocols build on each other

Next Lesson: NFTs and Token Standards.