Lab Session: Testnet Swap
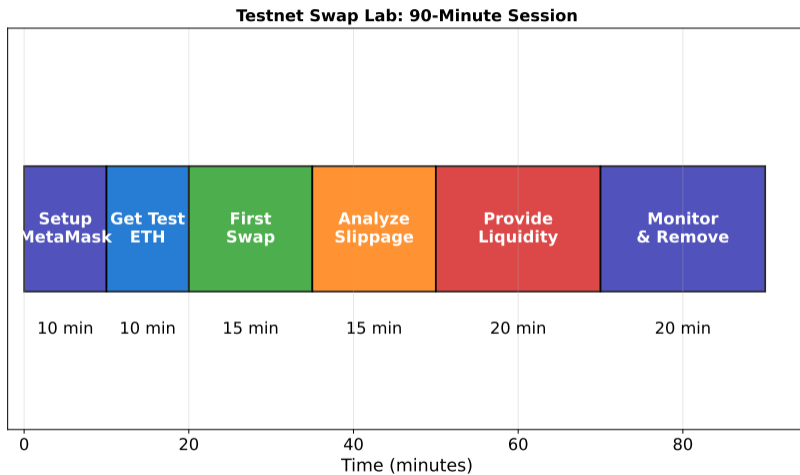## BSc Blockchain, Crypto Economy & NFTs

Course Instructor

Module E: DeFi Ecosystem

Learning Objectives

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

- Set up MetaMask wallet on Sepolia testnet
- Execute token swaps on Uniswap
- Analyze and understand slippage
- Provide and remove liquidity from AMM pools
- Track impermanent loss in practice

Testnet Swap Lab: 90-Minute Session

Hands-on DeFi experience with zero financial risk

Actions:

1. Install MetaMask browser extension
2. Create new wallet and save seed phrase
3. Enable test networks in settings
4. Switch to Sepolia Test Network

Safety Reminders:

- Testnet funds have NO real value
- Never share seed phrase
- Do NOT send real ETH to testnet address

Step 2: Acquire Testnet ETH

Sepolia Faucets:

- `https://sepoliafaucet.com`
- `https://sepoliafaucet.alchemy.com`

Process:

1. Copy Sepolia address from MetaMask
2. Paste into faucet and complete captcha
3. Request 0.5-1 testnet ETH
4. Wait for transaction confirmation

Step 3: Execute First Swap
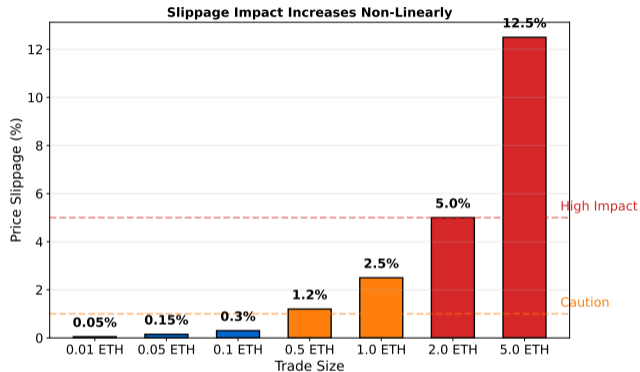
Goal: Swap 0.1 ETH for USDC on Uniswap

Process:

1. Connect wallet at https://app.uniswap.org
2. Select ETH to USDC swap
3. Enter amount and review rate
4. Confirm in MetaMask

Record:

- Exchange rate received
- Gas fee paid
- Transaction hash

Understanding Slippage

Slippage Impact Increases Non-Linearly

Larger trades face exponentially higher slippage - AMM fundamental
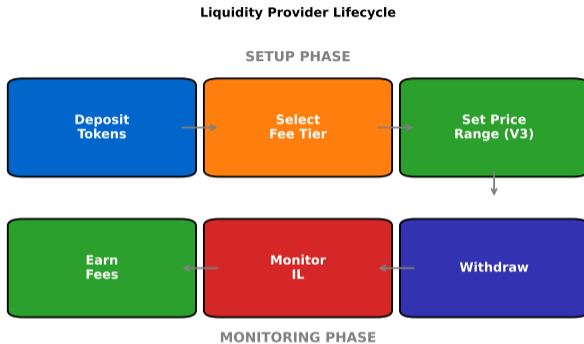
Step 4: Analyze Slippage

Experiment (DO NOT execute):

1. Quote 0.01 ETH swap - note price
2. Quote 0.1 ETH swap - note price
3. Quote 1 ETH swap - note price
4. Compare the three rates

Questions:

- How does price change with swap size?
- What causes non-linear slippage?
- How does pool liquidity affect slippage?

Liquidity Provider Lifecycle

SETUP PHASE

MONITORING PHASE

LPs earn fees but face impermanent loss risk

Step 5: Provide Liquidity

Goal: Become a liquidity provider

Process:

1. Click "Pool" tab on Uniswap
2. Select ETH/USDC pair
3. Choose fee tier (0.3% recommended)
4. Enter token amounts
5. Approve and confirm transaction

Record:

- ETH and USDC deposited
- Fee tier selected
- Initial position value

Step 6: Monitor and Remove Liquidity

After providing liquidity:

- Check pool share percentage
- Monitor fees earned
- Execute a swap to see fees accrue

Remove Liquidity:

1. Click on your position
2. Select "Remove Liquidity"
3. Confirm withdrawal
4. Compare final amounts to initial deposit

Lab Deliverables

Submit:

1. **Lab Report (3-4 pages):**
   - Swap details and exchange rates
   - Slippage analysis observations
   - LP position and impermanent loss calculation
   - Reflection on DeFi user experience

2. **Supporting Evidence:**
   - Transaction hashes (Etherscan links)
   - Screenshots of key steps

Key Takeaways

- Testnets enable risk-free DeFi experimentation
- Slippage increases non-linearly with trade size
- Liquidity providers earn fees but face impermanent loss
- DEX UX has improved but remains more complex than CEX
- Understanding mechanics is essential before using real funds