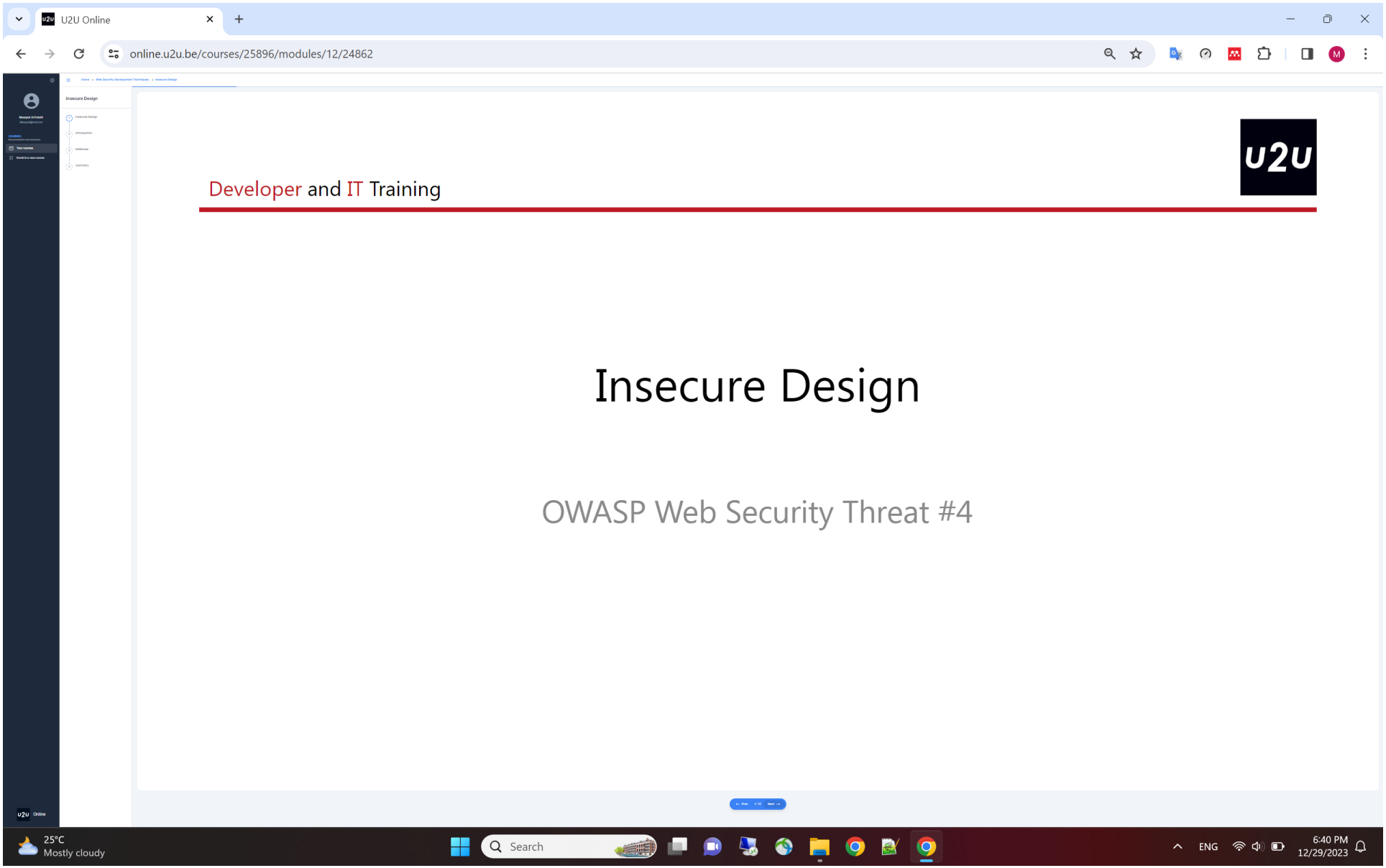
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Insecure Design
Developer and IT Training
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Insecure Design
OWASP Web Security Threat #4
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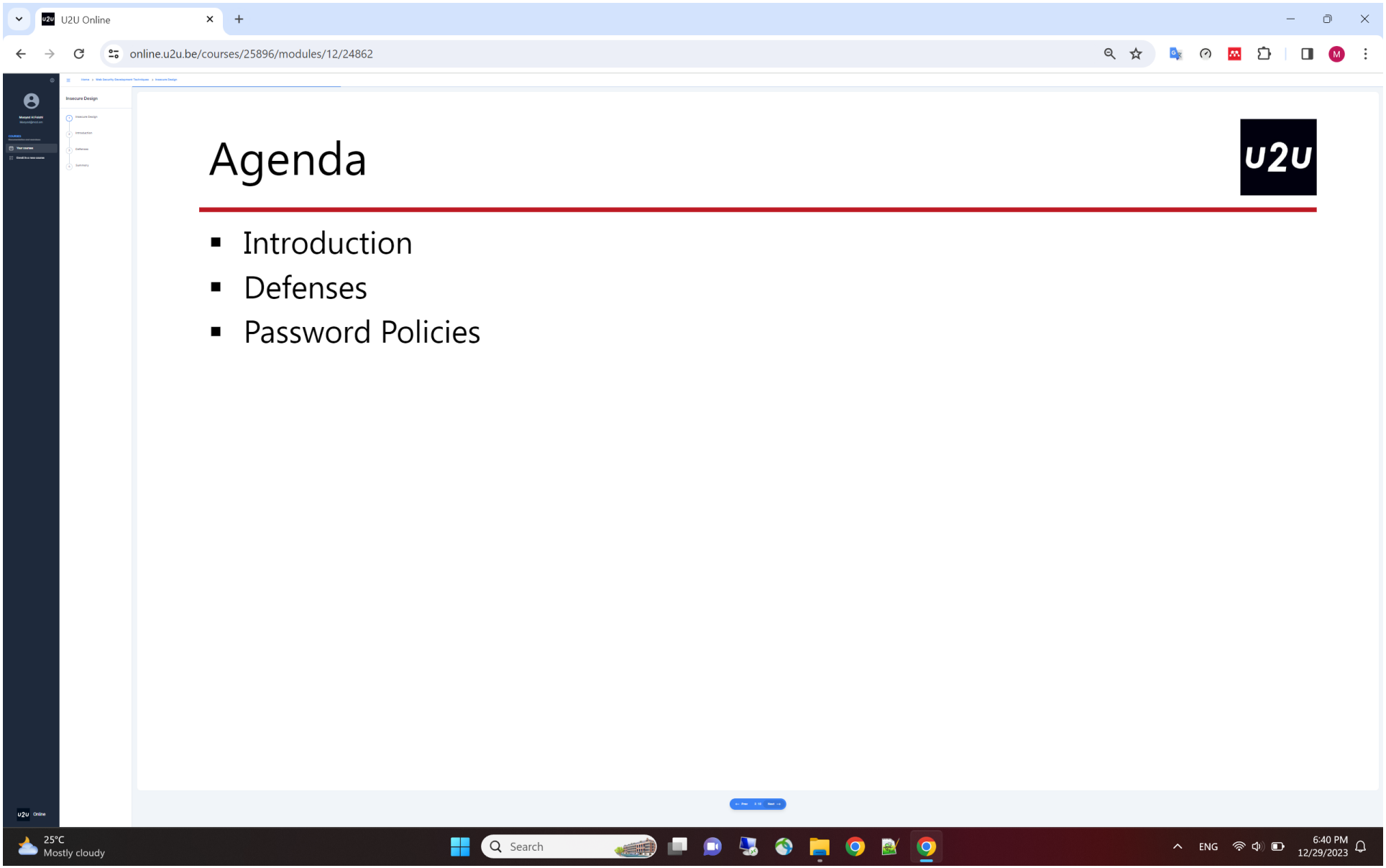
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Insecure Design
Agenda
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Introduction
Defenses
Password Policies
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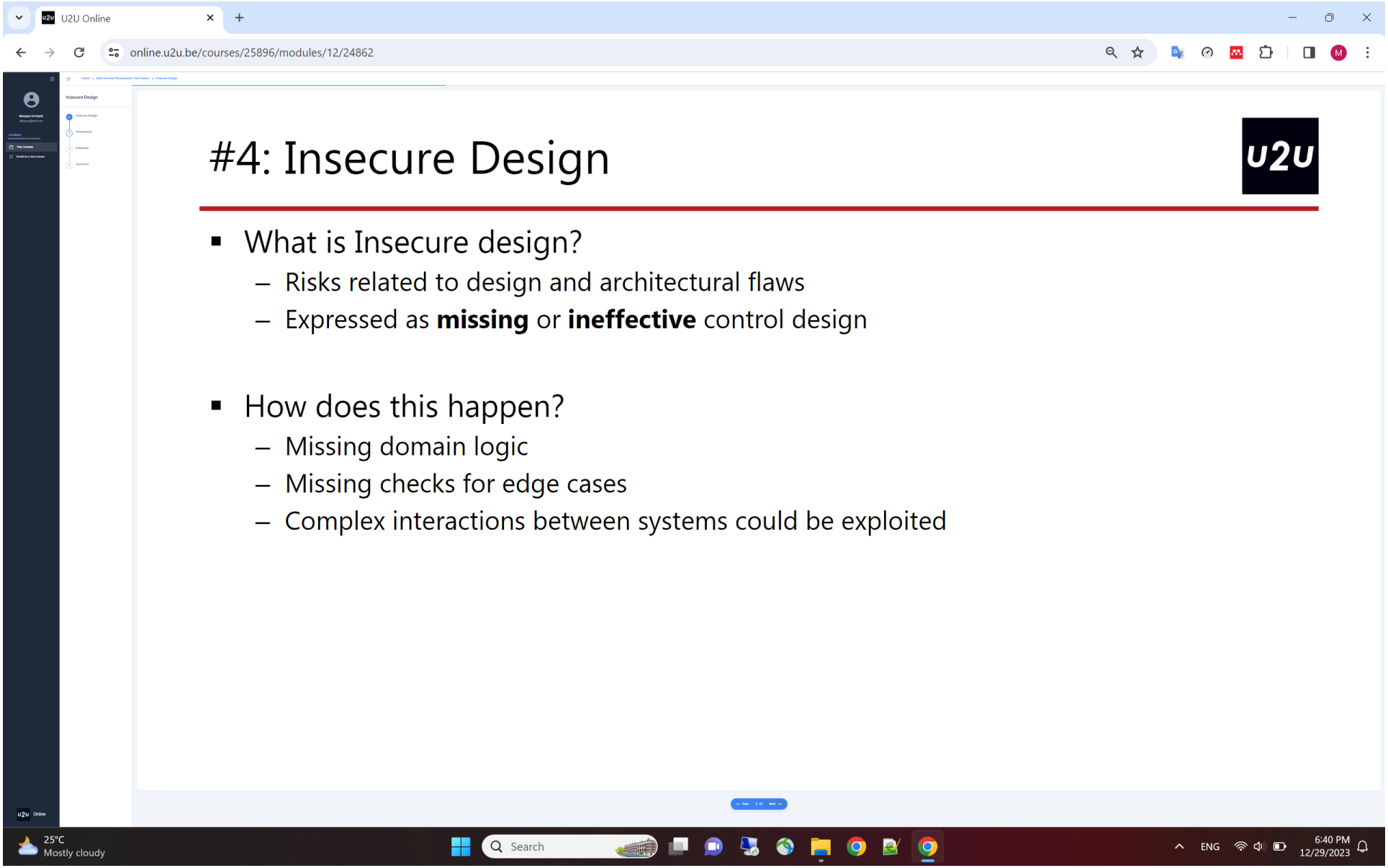
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#4: Insecure Design
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What is Insecure design?
Risks related to design and architectural flaws
Expressed as missing or ineffective control design
How does this happen?
Missing domain logic
Missing checks for edge cases
Complex interactions between systems could be exploited
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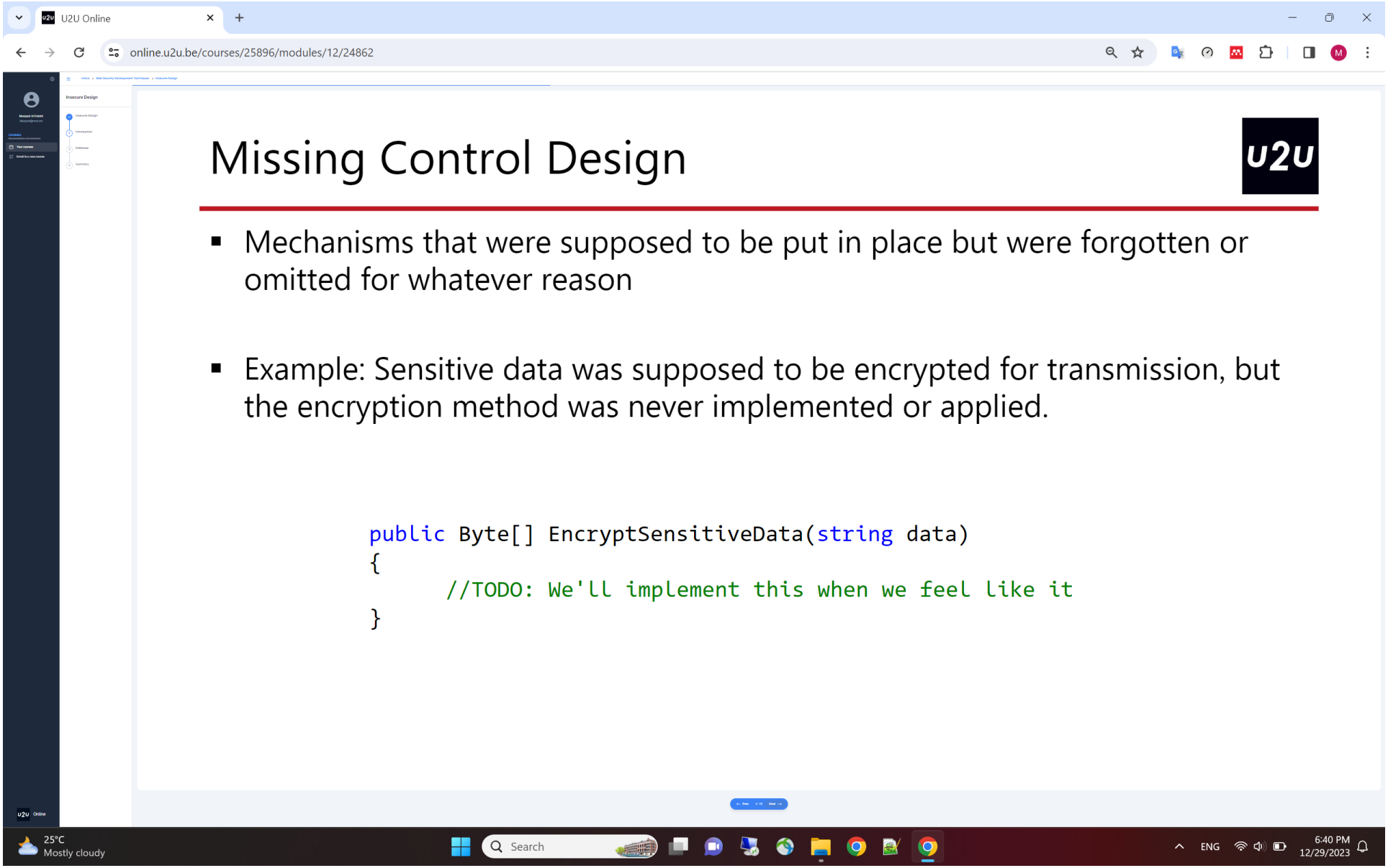
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Insecure Design
Introduction
Defenses
Summary
Missing Control Design
U2U
Mechanisms that were supposed to be put in place but were forgotten or omitted for whatever reason
Example: Sensitive data was supposed to be encrypted for transmission, but the encryption method was never implemented or applied.
public Byte[] EncryptSensitiveData(string data)
{
//TODO: We'll implement this when we feel like it
}
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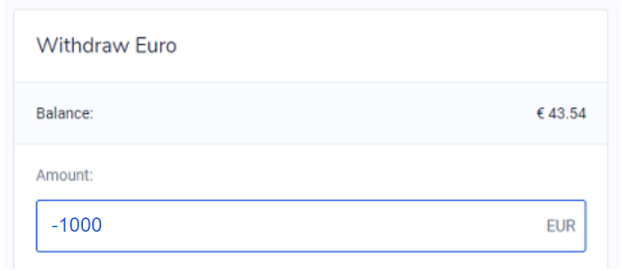
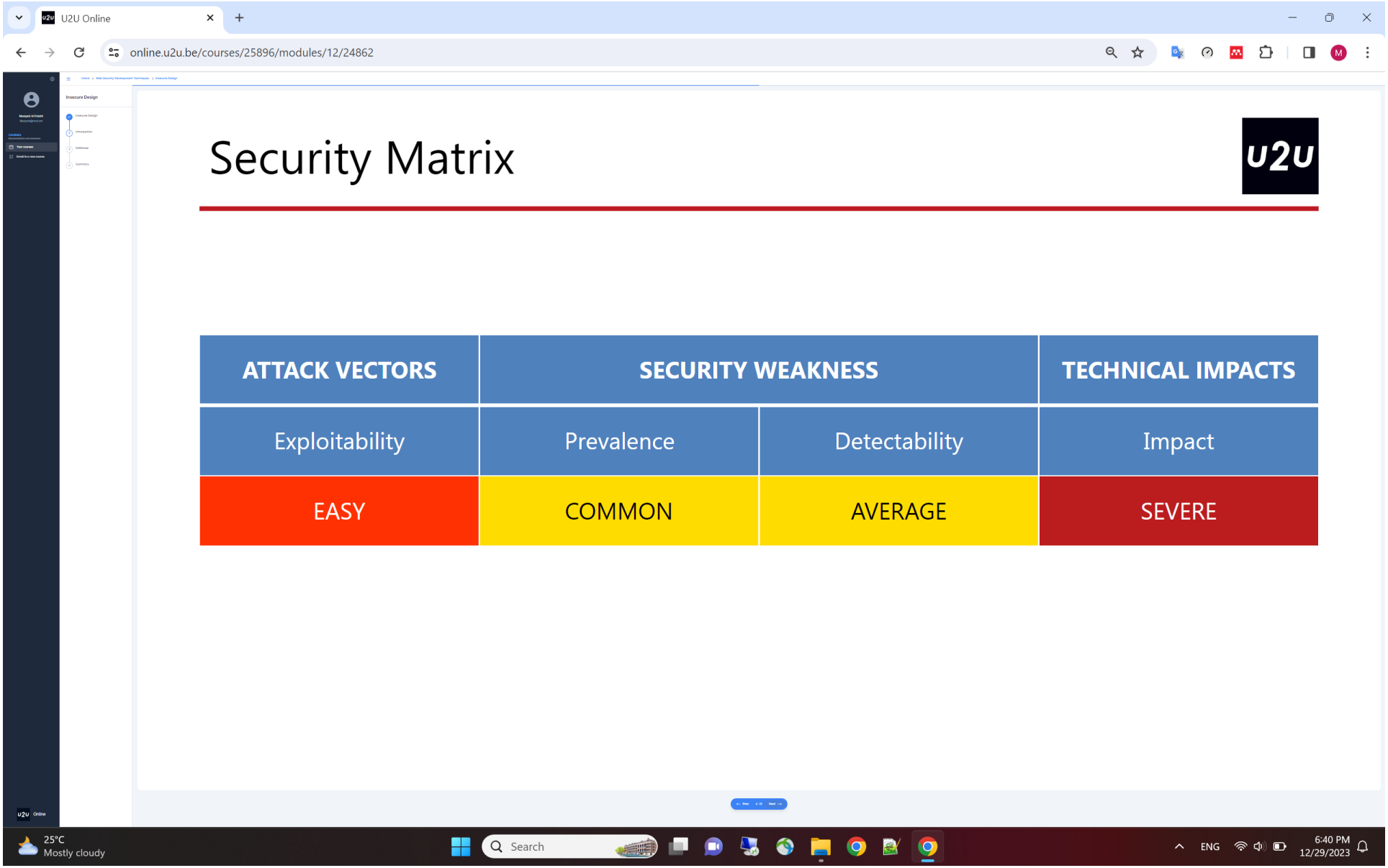
Ineffective Control Design

- Mechanisms that allow for an attack to happen because of insufficient checks
- Example: a method is supposed to update an account owner's balance after withdrawing money, but it doesn't check the sign of the amount that is being withdrawn

```
public void Withdraw(decimal amount)
{
  this.balance -= amount;
}
```

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Insecure Design
Security Matrix
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ATTACK VECTORS
SECURITY WEAKNESS
TECHNICAL IMPACTS
Exploitability
Prevalence
Detectability
Impact
EASY
COMMON
AVERAGE
SEVERE
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Example Scenarios

- New video card or gaming console is released
- E-commerce sites allow botnets to buy all available units
- Scalpers use these botnets to create scarcity and drive up price
- Both hardware manufacturer and e-commerce site suffer terrible publicity

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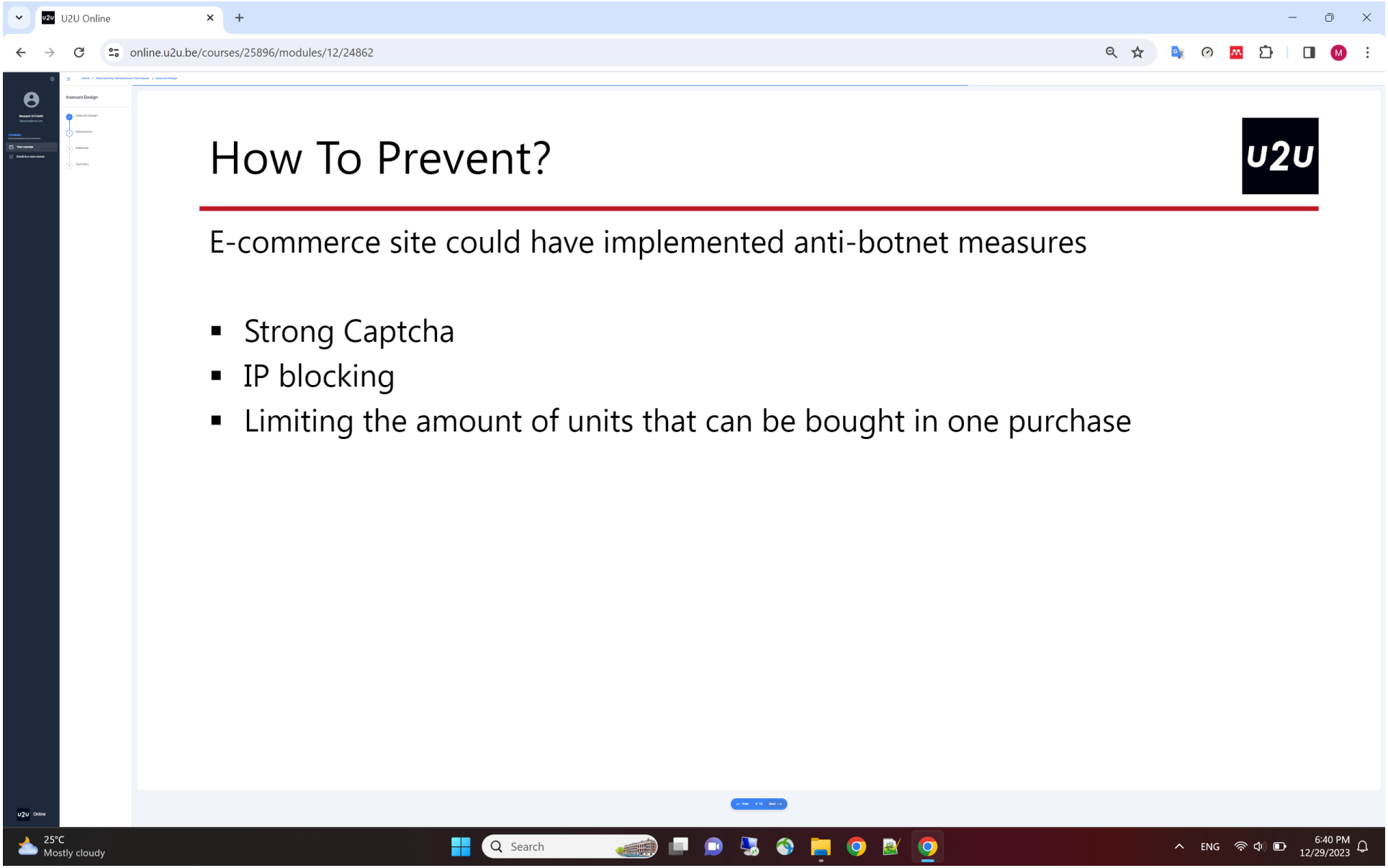
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Insecure Design
How To Prevent?
u2u
E-commerce site could have implemented anti-botnet measures
Strong Captcha
IP blocking
Limiting the amount of units that can be bought in one purchase
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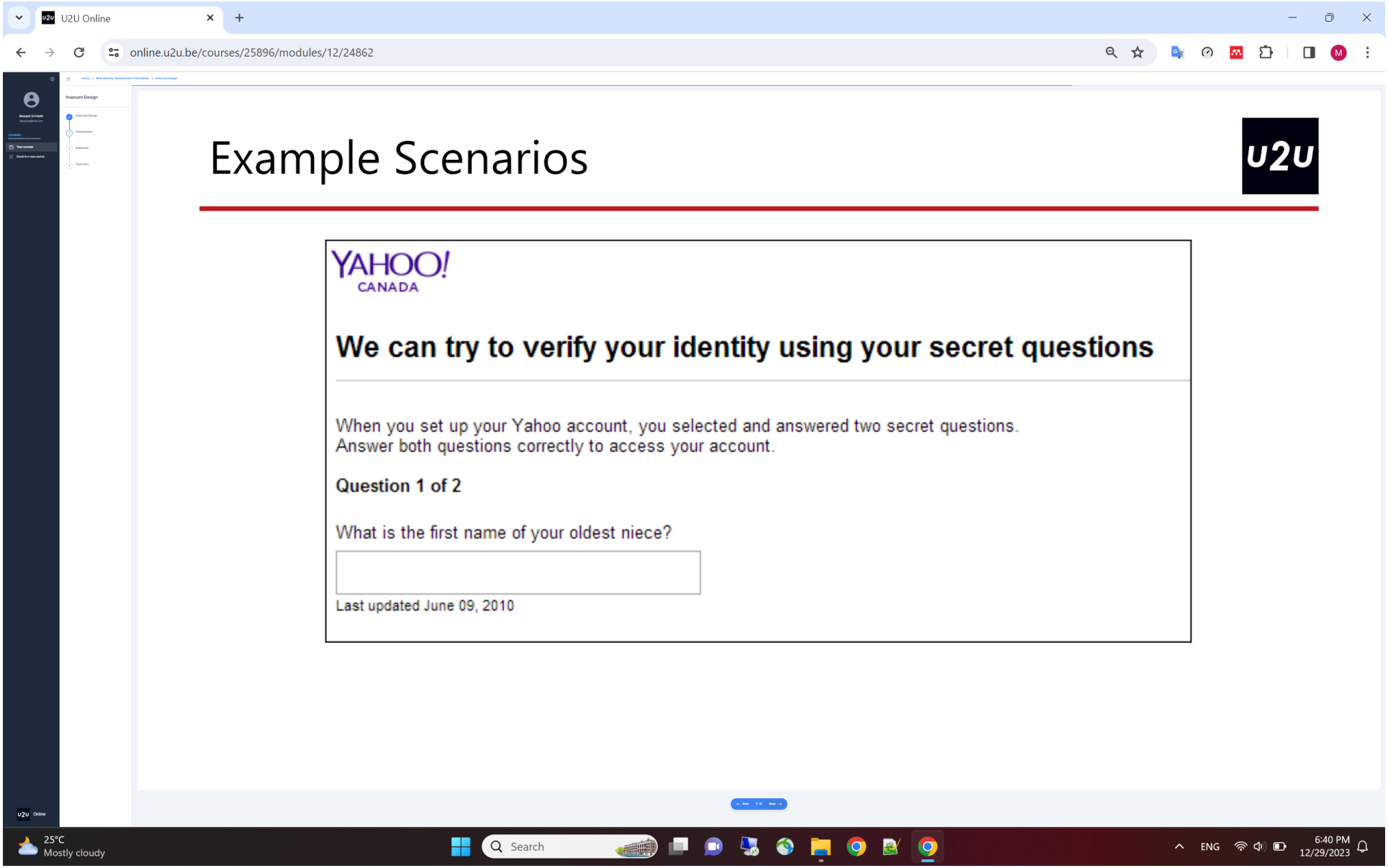
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Insecure Design
Introduction
Defenses
Summary
Example Scenarios
u2u
YAHOO!
CANADA
We can try to verify your identity using your secret questions
When you set up your Yahoo account, you selected and answered two secret questions.
Answer both questions correctly to access your account.
Question 1 of 2
What is the first name of your oldest niece?
Last updated June 09, 2010
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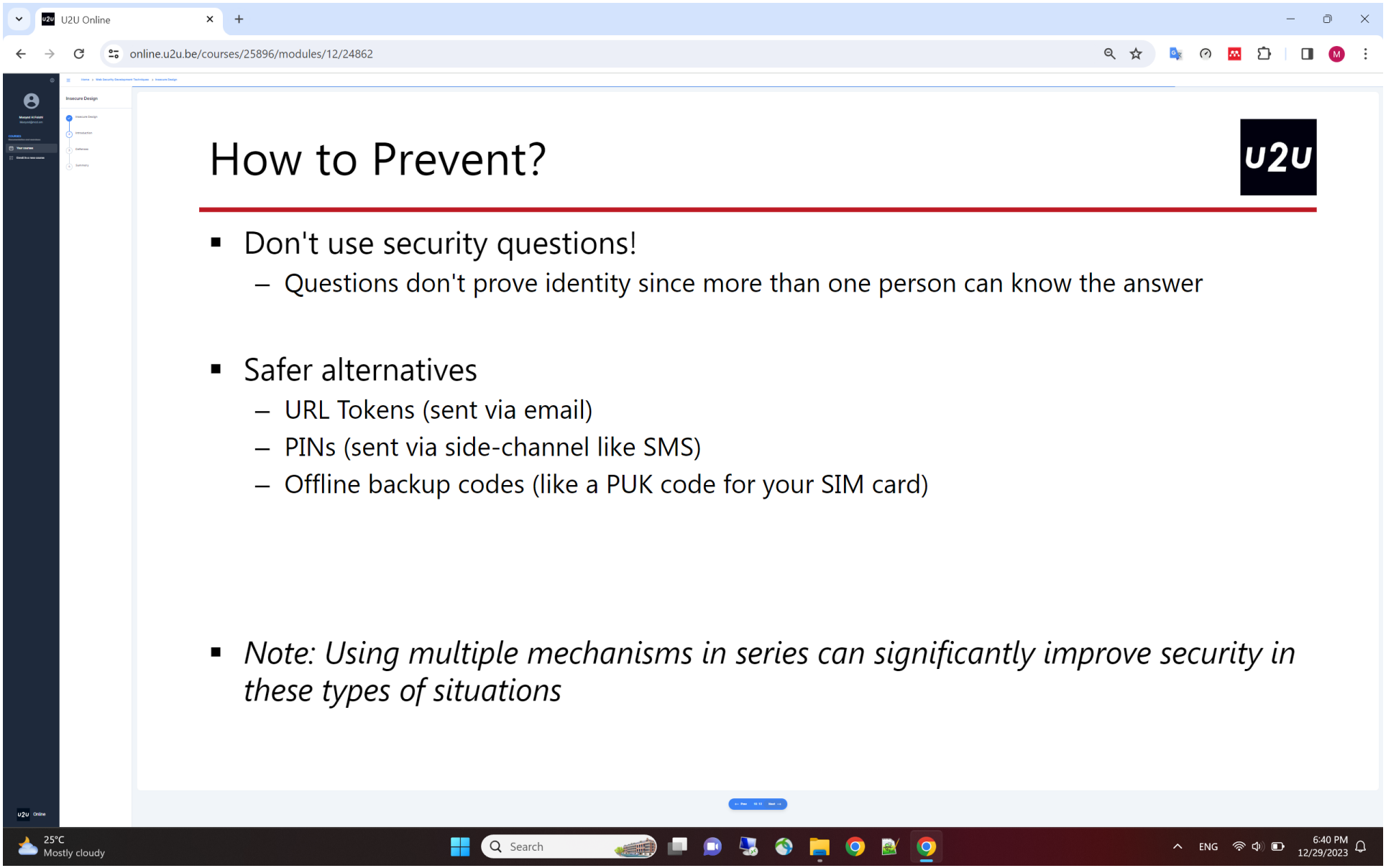
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Insecure Design
How to Prevent?
u2u
Don't use security questions!
– Questions don't prove identity since more than one person can know the answer
Safer alternatives
– URL Tokens (sent via email)
– PINs (sent via side-channel like SMS)
– Offline backup codes (like a PUK code for your SIM card)
Note: Using multiple mechanisms in series can significantly improve security in these types of situations
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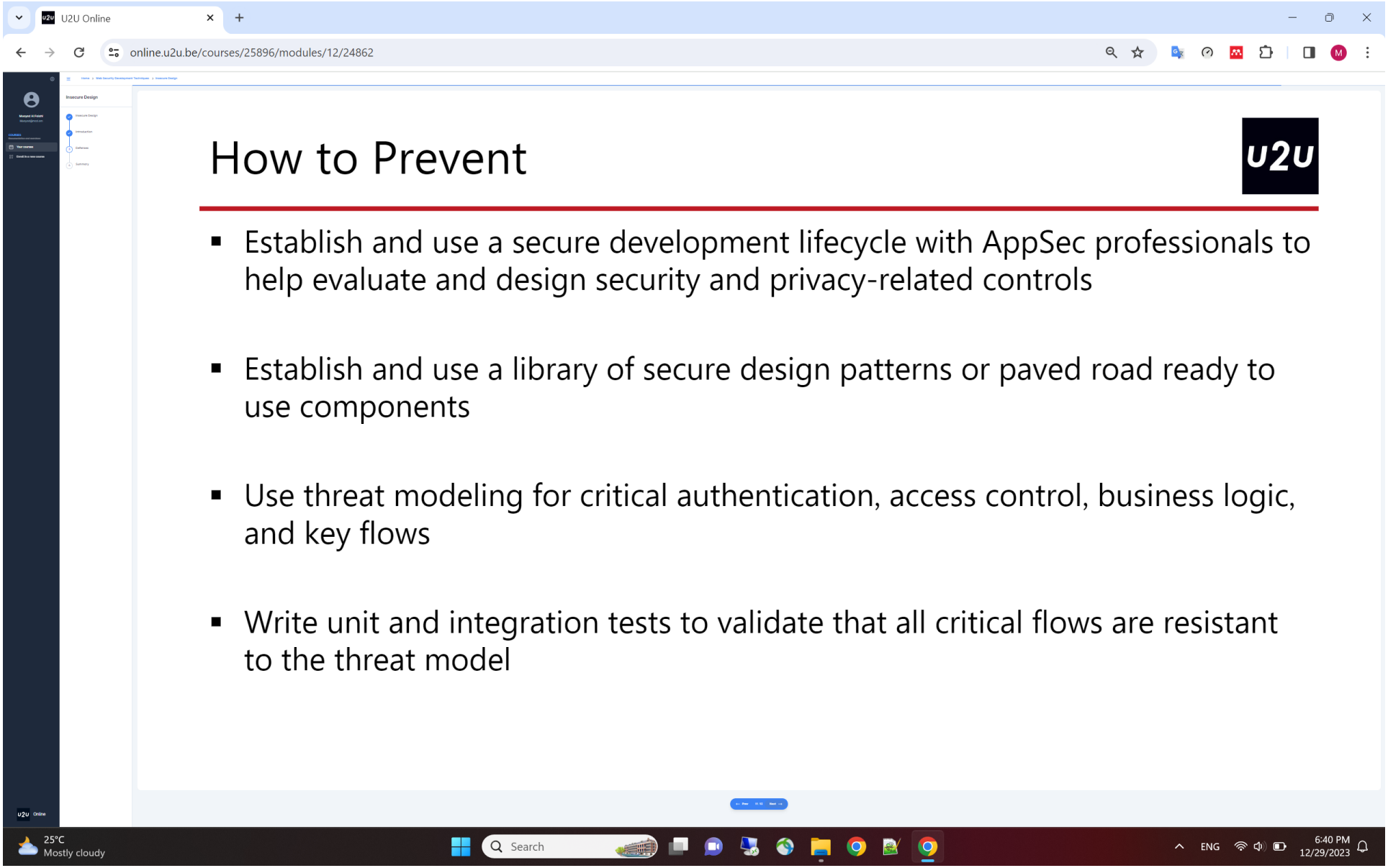
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How to Prevent
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Establish and use a secure development lifecycle with AppSec professionals to help evaluate and design security and privacy-related controls
Establish and use a library of secure design patterns or paved road ready to use components
Use threat modeling for critical authentication, access control, business logic, and key flows
Write unit and integration tests to validate that all critical flows are resistant to the threat model
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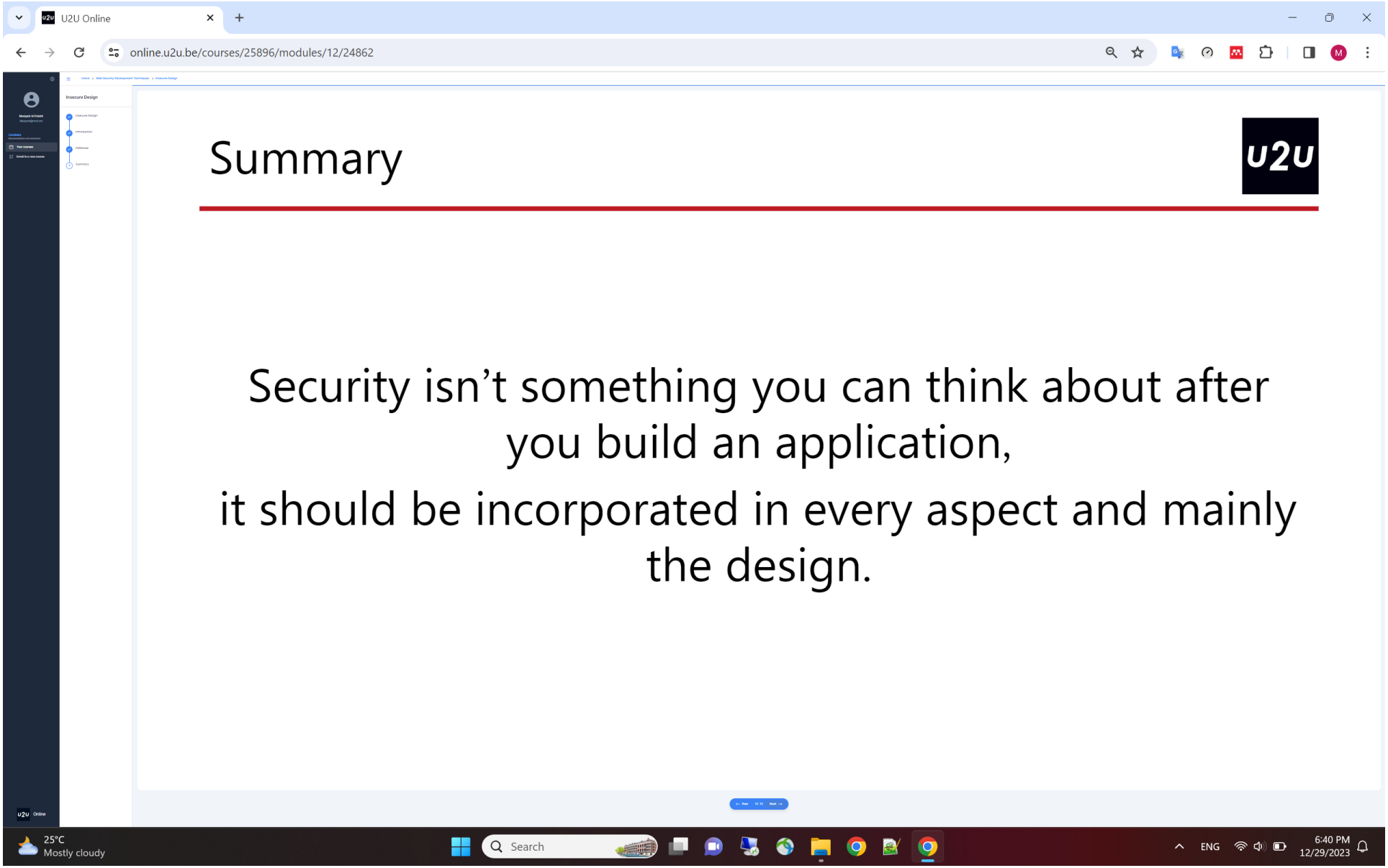
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Insecure Design
Summary
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Security isn't something you can think about after you build an application,
it should be incorporated in every aspect and mainly the design.
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