SOFTWARE DESIGN AND ANALYSIS

Lecture 1- Introduction

Agenda

- Instructor's Introduction
- Course Introduction

About the instructor

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About you?

- Introduce yourself

  – *Name*

  – *Hobbies*

  – *Future Goals*

About the Course

- Software Design and Analysis (CS-3004)
- Data Structures (**Prerequisites**)
- Your Expectation?
  - *Theoretical?*
- Major engineering problem today
  - *Predictable development of reliable software system*

Software Design and Analysis

- Introduction to basic concepts of object-oriented paradigm.
- Elicitation of requirements through use cases, identification of domain concepts through domain model, selection of classes and assigning roles and responsibilities to various classes.
- Focus on training by applying UML 2.x notation to fundamental OOAD concepts objects, classes, components, subsystems, stereotypes, relationships, supporting diagrams and design patterns.

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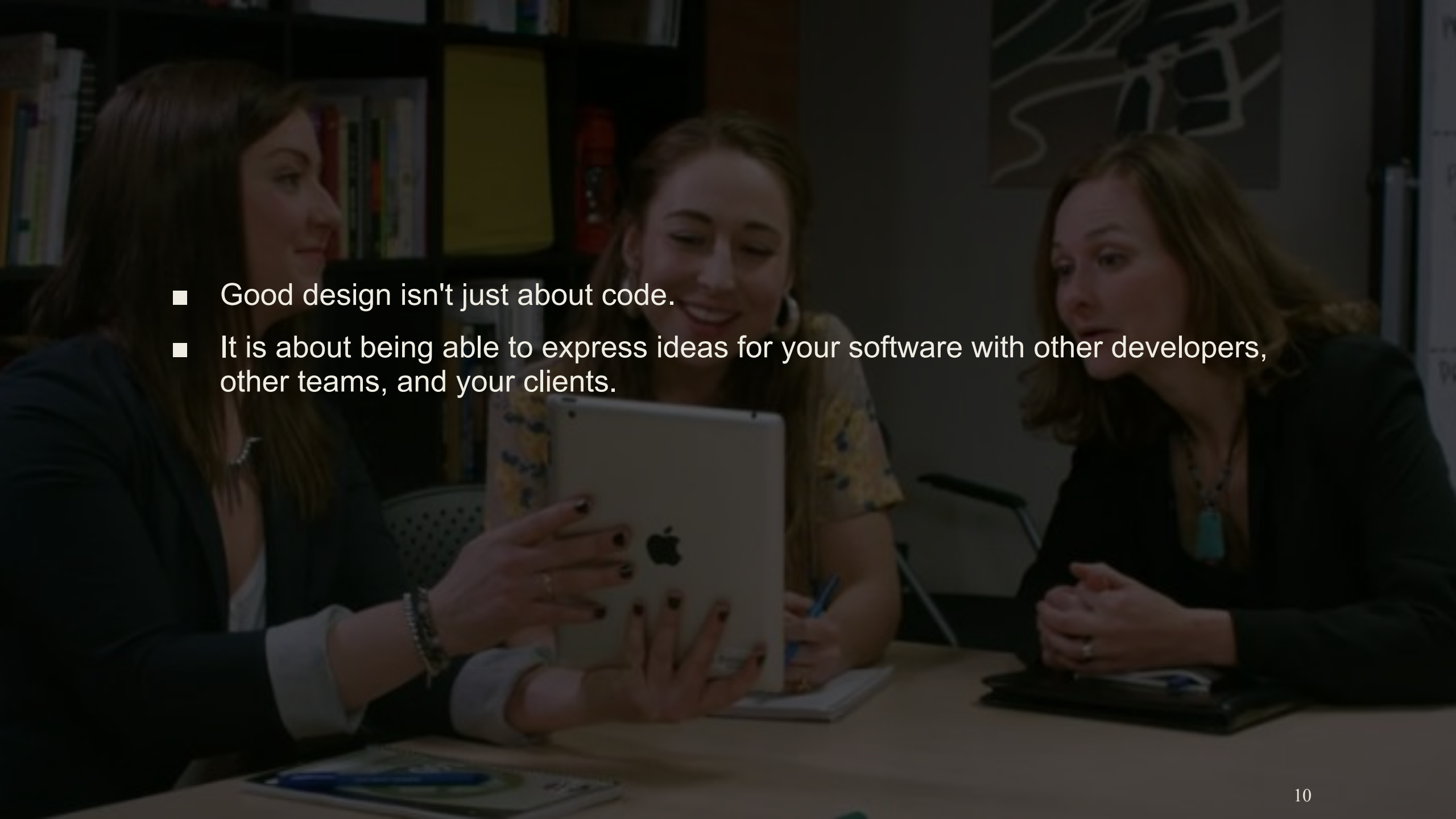
- Was there even a design at all?
- How do you know if the software was well-designed?



- Good design isn't just about code.
- It is about being able to express ideas for your software with other developers, other teams, and your clients.

- Having a well-thought design makes your software easier to implement, reduces a need for major changes later in the project and it saves you from headaches down the line.

Why SDA?

- Software Design Analysis will help your software become
  - flexible
  - reusable
  - maintainable

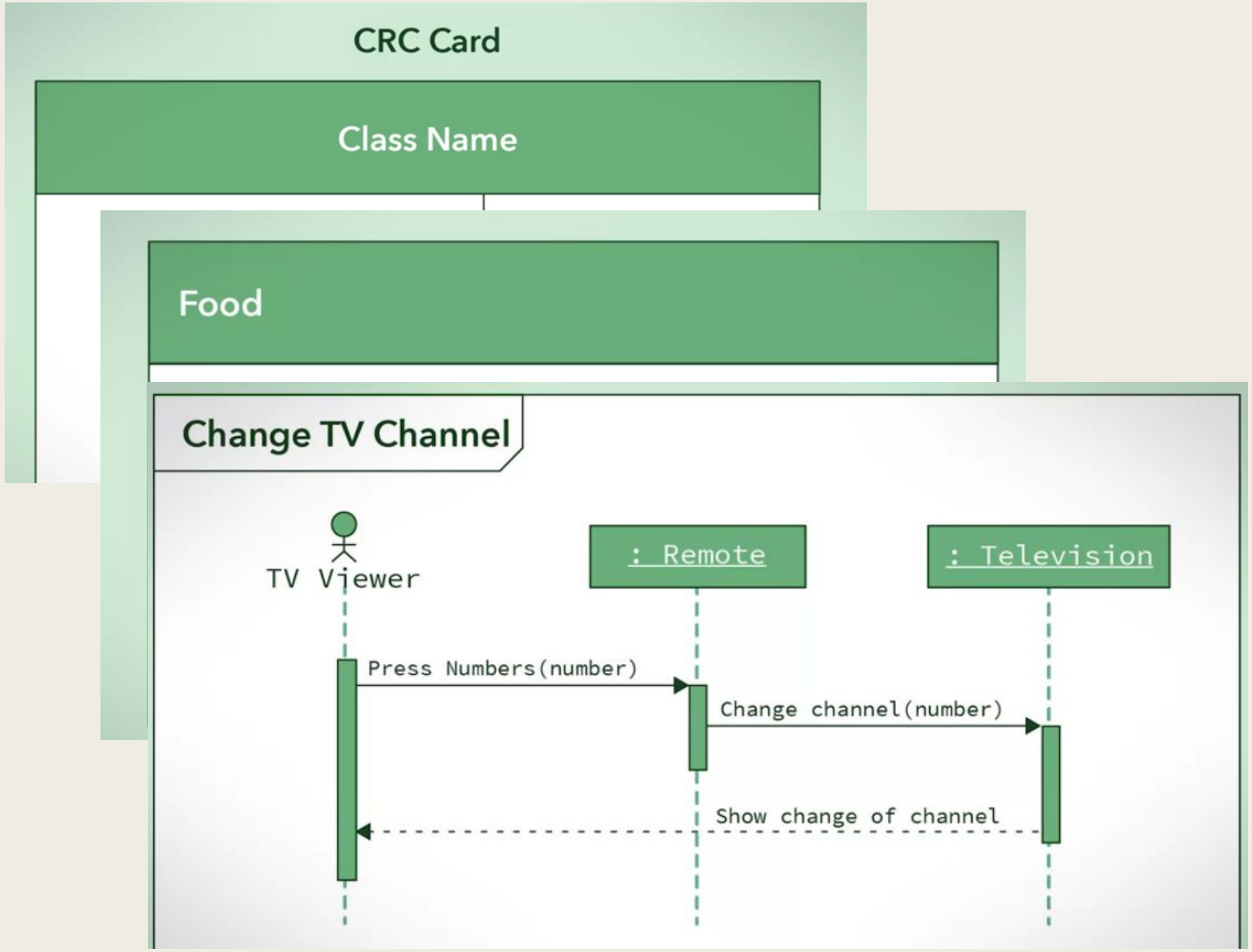
- What is software design analysis?
- How does it improve your software products?

Scenario 1

- You join a project that's been in development for a while.
- You look at the code and become instantly overwhelmed.
- You can't tell what the purpose of the pieces are, things are unorganized and design documentation is non-existent.
- You don't even know where to begin. These are all signs that the project was not well-designed.

Scenario 2:

- You are now working on a personal development project.
- When you began, you weren't quite sure what the functionalities would be, but you just started coding.
- It didn't matter that the code was unorganized because you were the only one working on it and you know how it works.
- You came up with a great new feature for your product, but in implementing it, you broke the program elsewhere.



Course Design

- How to express in document the design and architecture of a software system using a visual notation

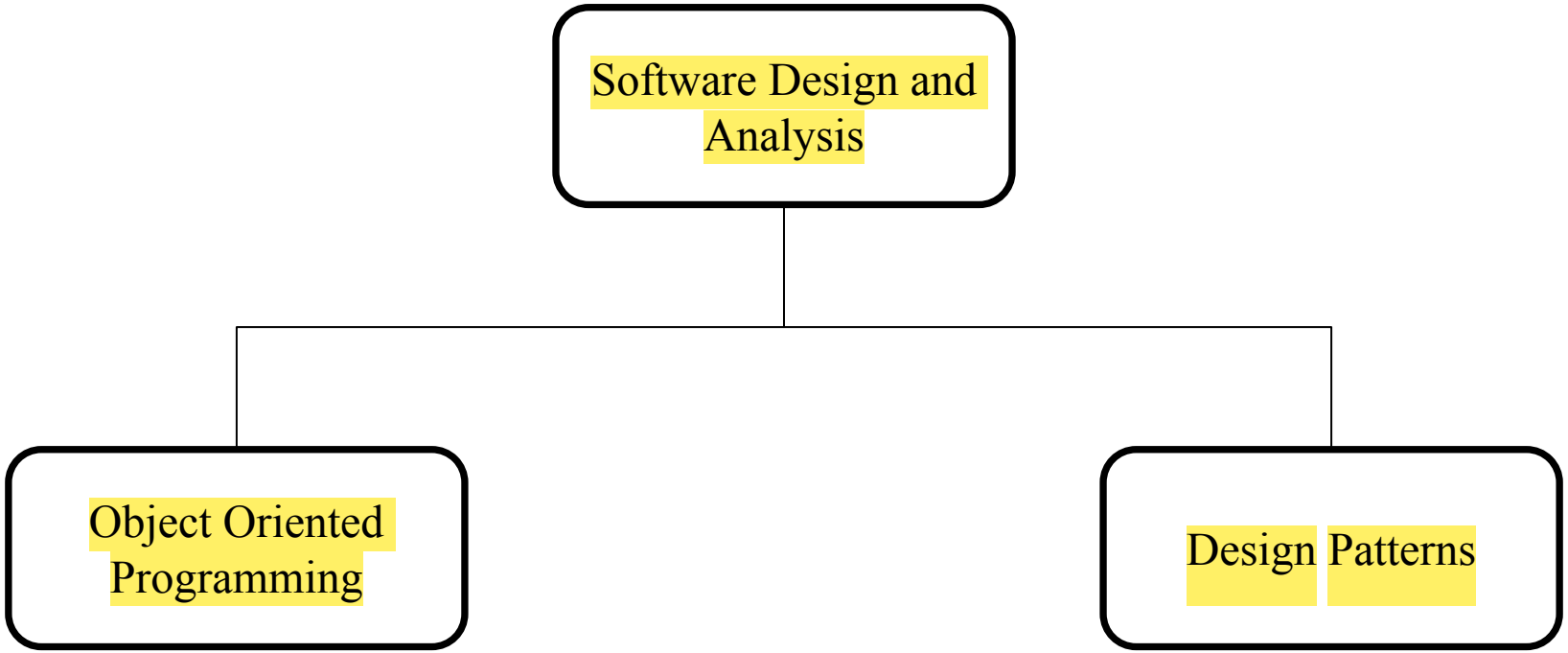
SDA role in industry

- Like many roles in the software industry, the software designer or a software architect role can look very different from company to company.
- Characteristics like:
  - *Company size*
  - *Scope of the project*
  - *Experience of the development team*
  - *Organizational structure*
  - *Age of the company*

  can all impact what these roles look like

- In some companies, there may be a distinct role for a software designer or architect.
- In other companies, the design may be completed by a member or members of the development team.

- Great software designers and architects are detail-oriented, forward thinkers.
- They need to be able to see the product at both the low and high levels.
- They need to be creative problem solvers to produce a quality solution for the problem at hand.
- They need to be able to express these ideas effectively with the product manager and the development team.


Software Design and Analysis
Object Oriented Programming
Design Patterns

THANKS