IBM Software Group

Essentials of Visual Modeling with UML

Module 5: Interaction Diagrams

Rational. software

Objectives

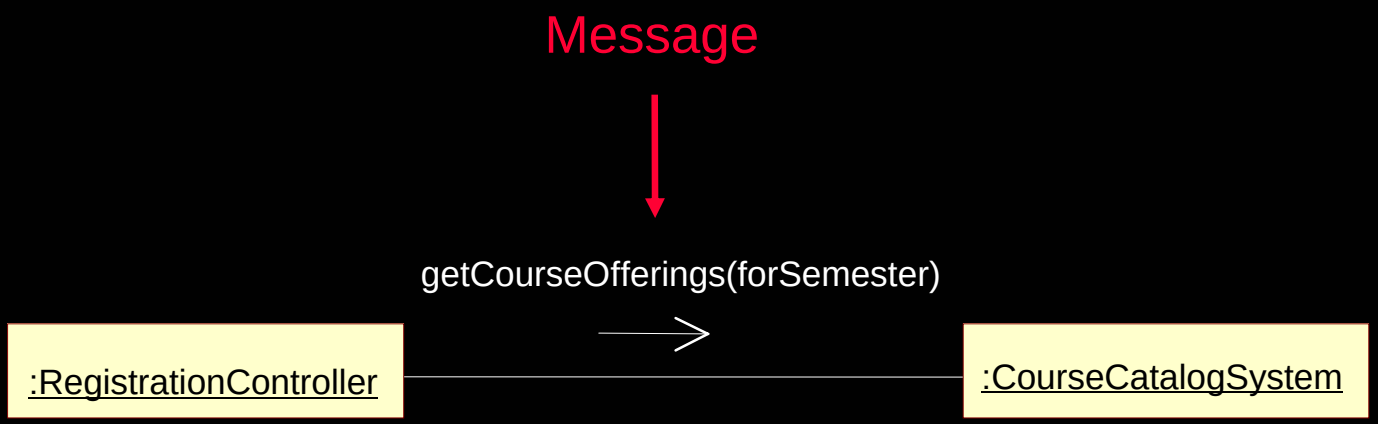
- Describe dynamic behavior and show how to capture it in a model.
- Demonstrate how to read and interpret:
  - A collaboration diagram
  - A sequence diagram
- Explain the similarities and differences between collaboration and sequence diagrams.

Objects Need to Collaborate

- Objects are useless unless they can collaborate to solve a problem.
  - Each object is responsible for its own behavior and status.
  - No one object can carry out every responsibility on its own.
- How do objects interact with each other?
  - They interact through messages.

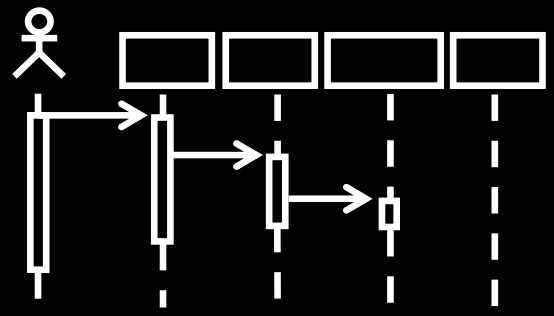
Objects Interact with Messages

- A message shows how one object asks another object to perform an operation.

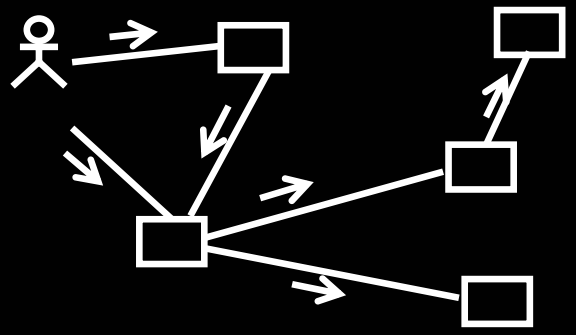


What Is an Interaction Diagram?

- An interaction diagram shows an interaction that consists of a set of objects and their relationships, including the messages that may be dispatched among them.
- It models the dynamic aspects of a system.



Sequence Diagrams



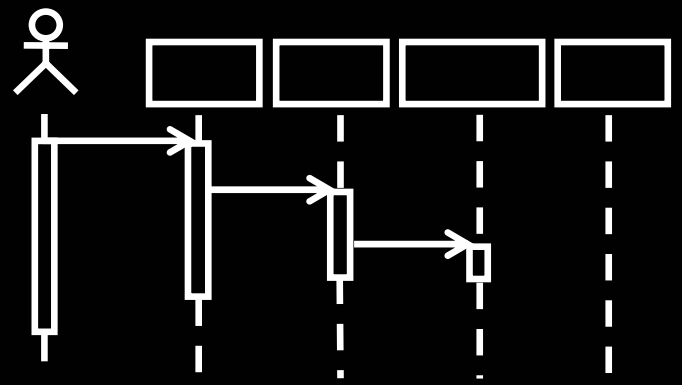
Collaboration Diagrams

Where Are We?

- ★ Sequence diagrams
- Collaboration diagrams
- Interaction diagram comparison

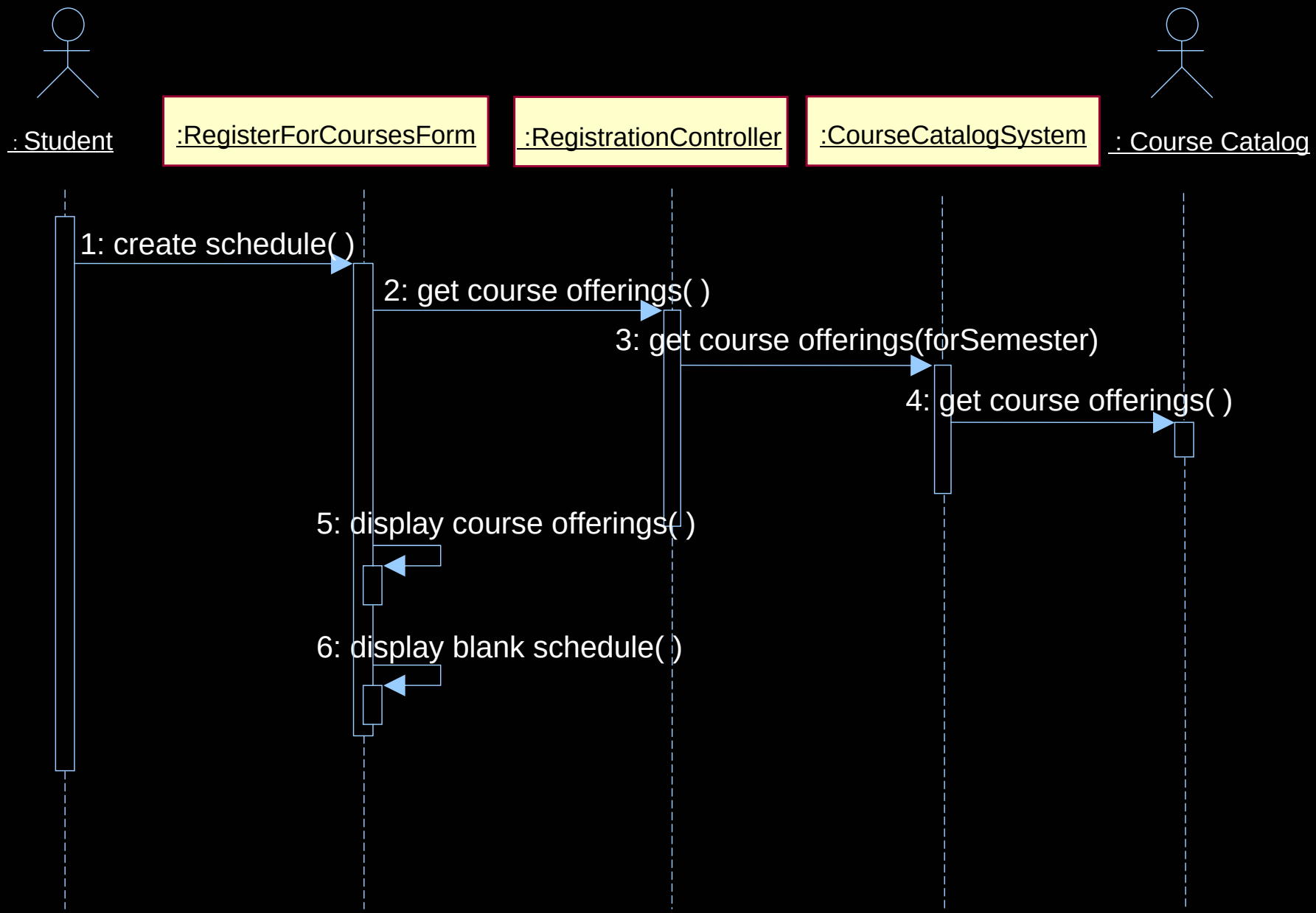
What Is a Sequence Diagram?

- A sequence diagram is an interaction diagram that emphasizes the time ordering of messages.
- The diagram shows:
  - The objects participating in the interaction.
  - The sequence of messages exchanged.

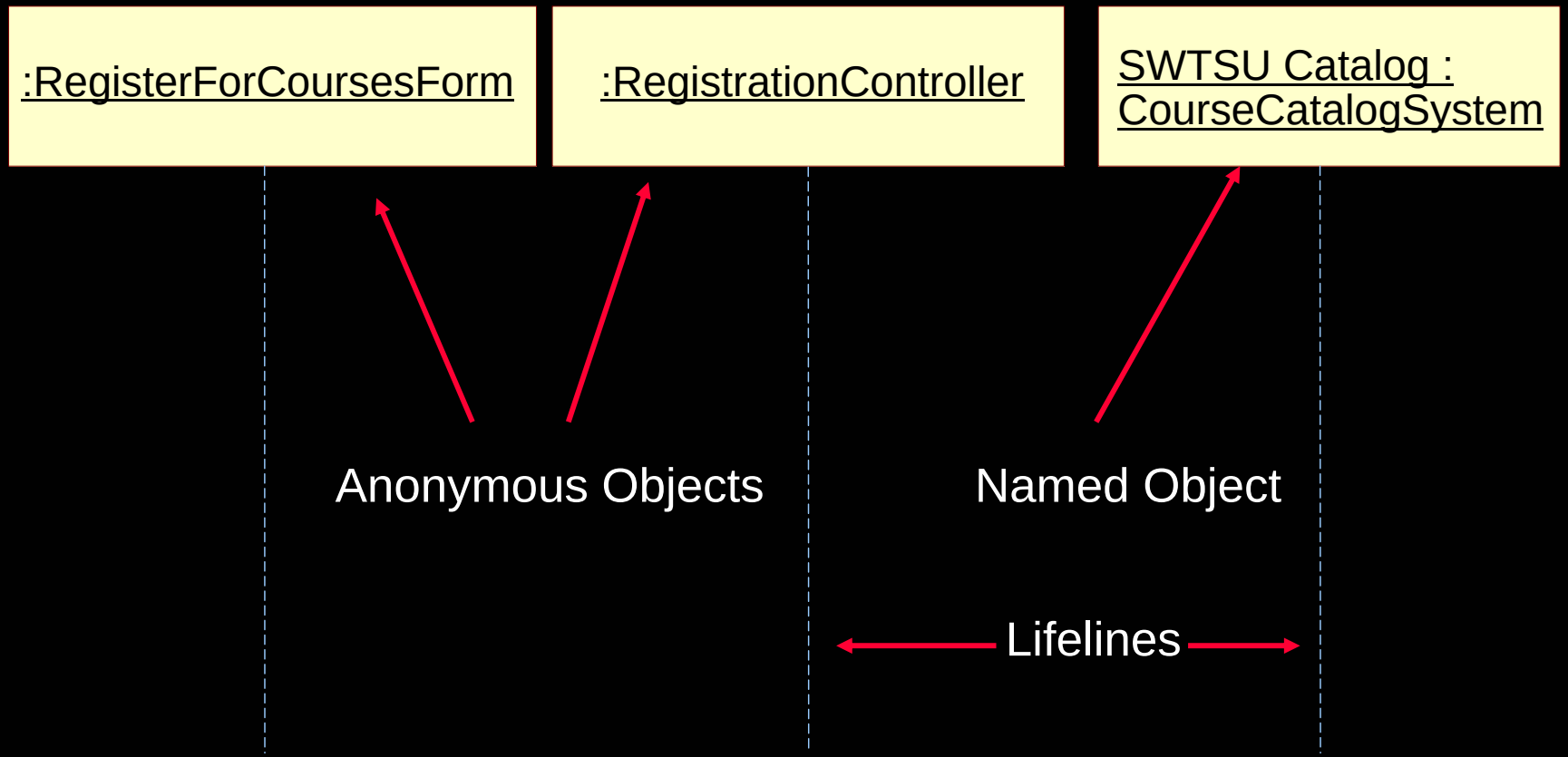


Sequence Diagrams

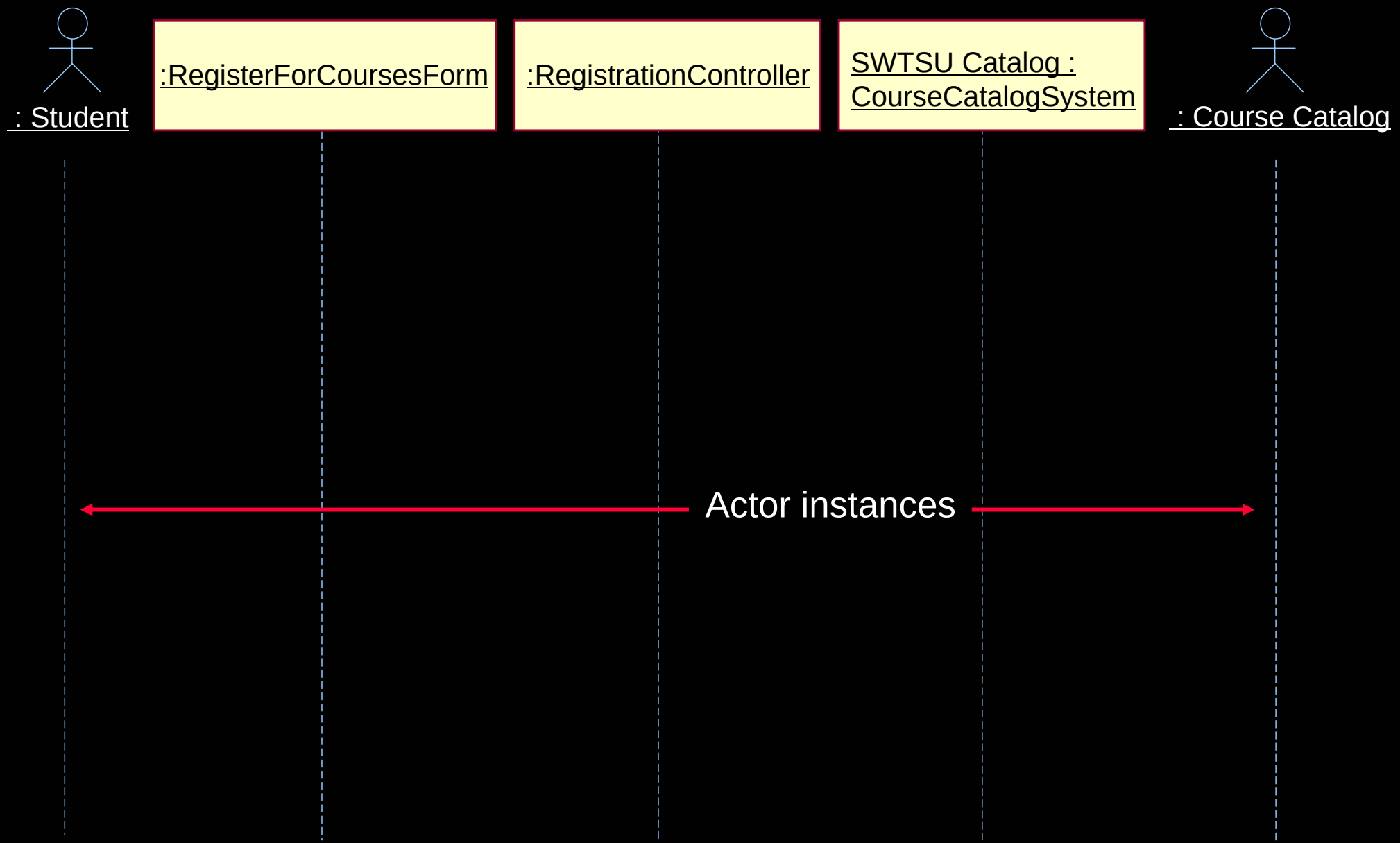
Example: Sequence Diagram



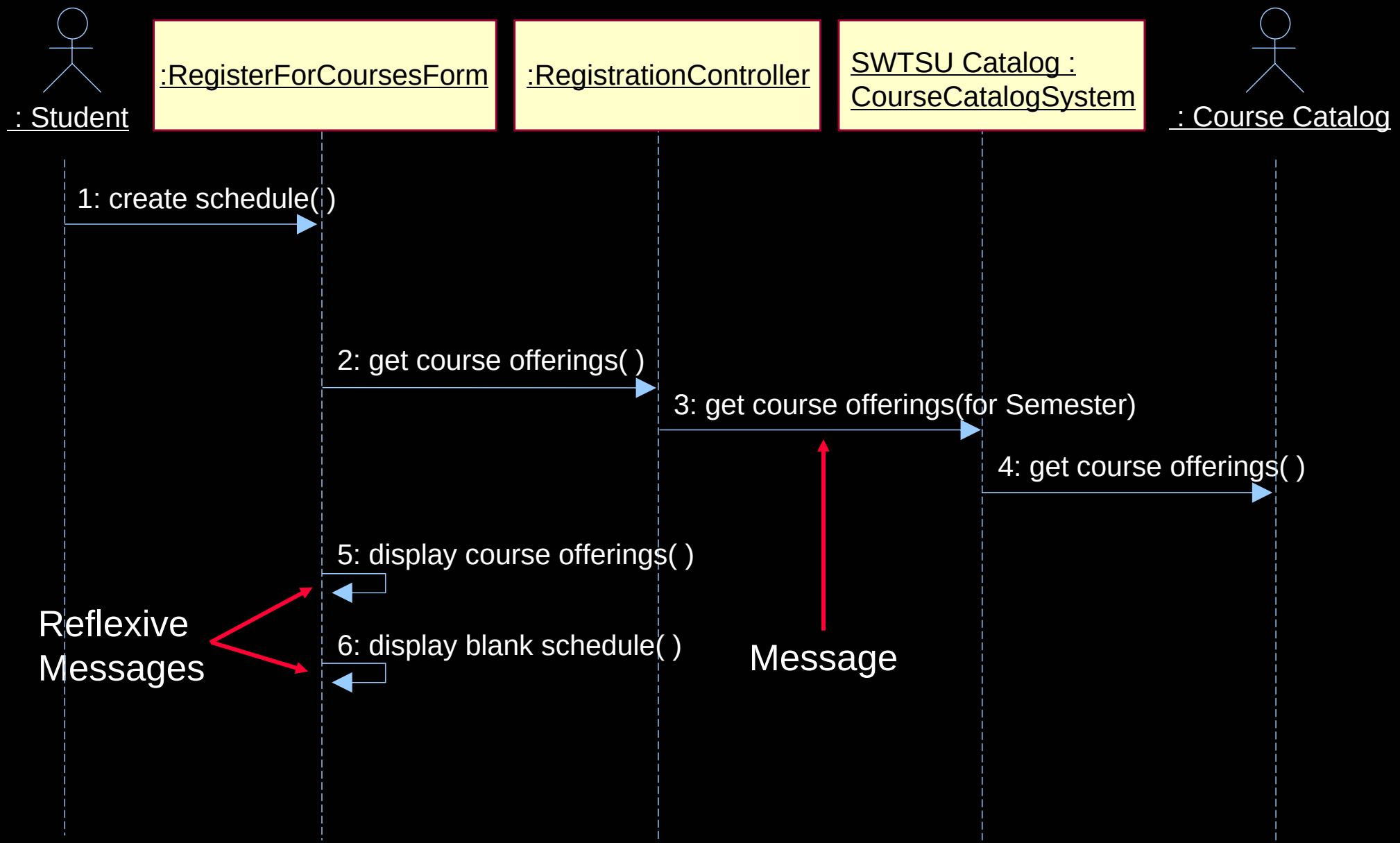
Sequence Diagram Contents: Objects



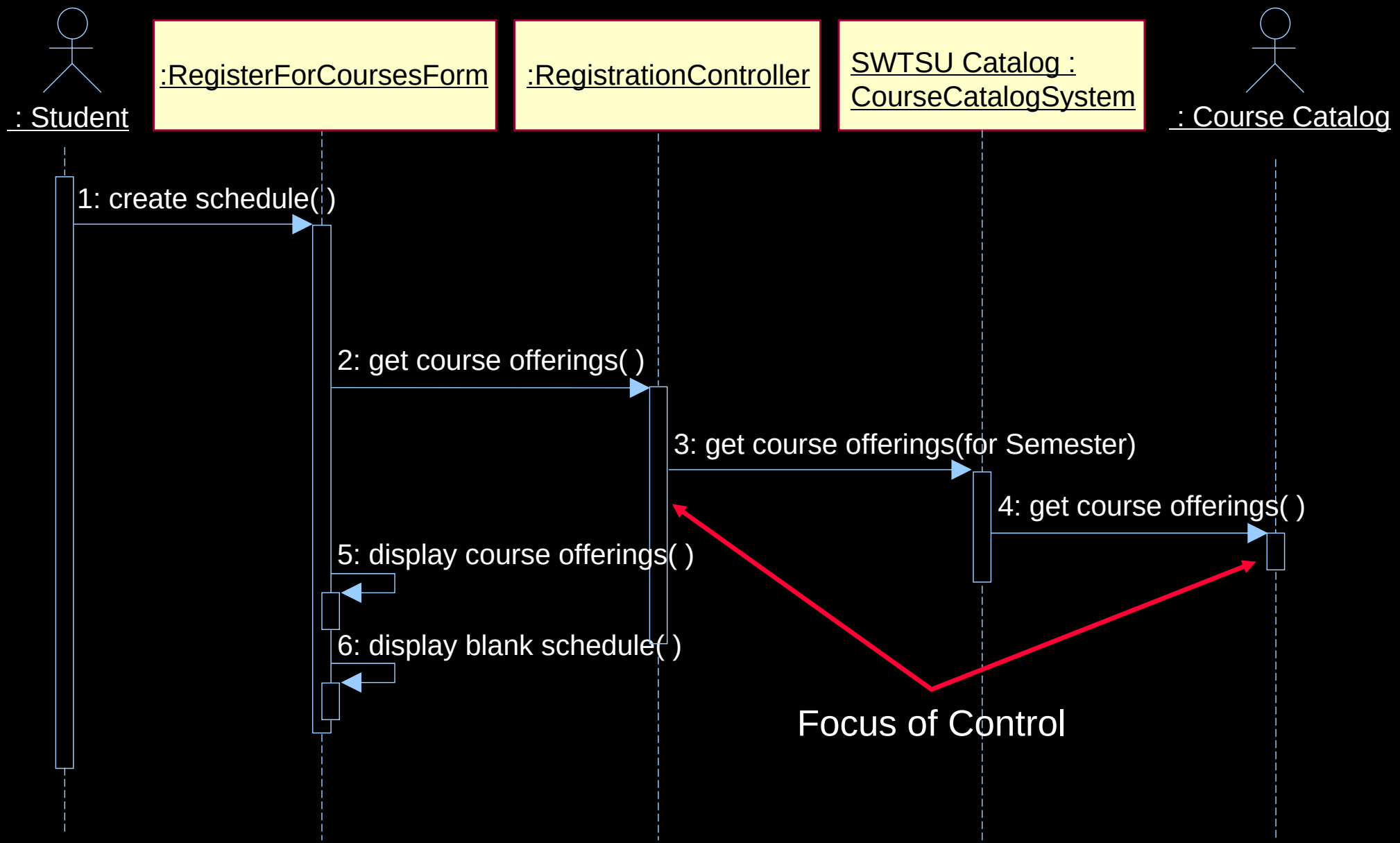
Sequence Diagram Contents: Actor



Sequence Diagram Contents: Messages



Sequence Diagram Contents: Focus of Control

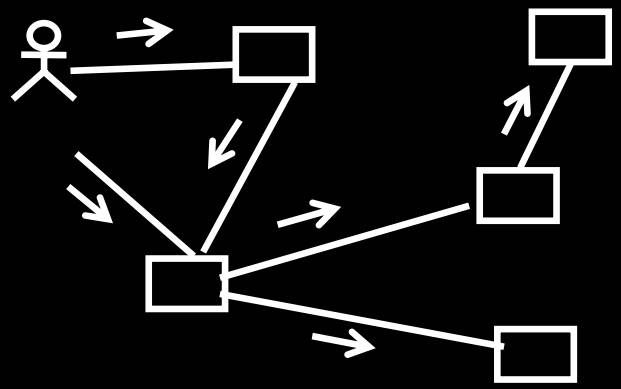


Where Are We?

- Sequence diagrams
- ★ Collaboration diagrams
- Interaction diagram comparison

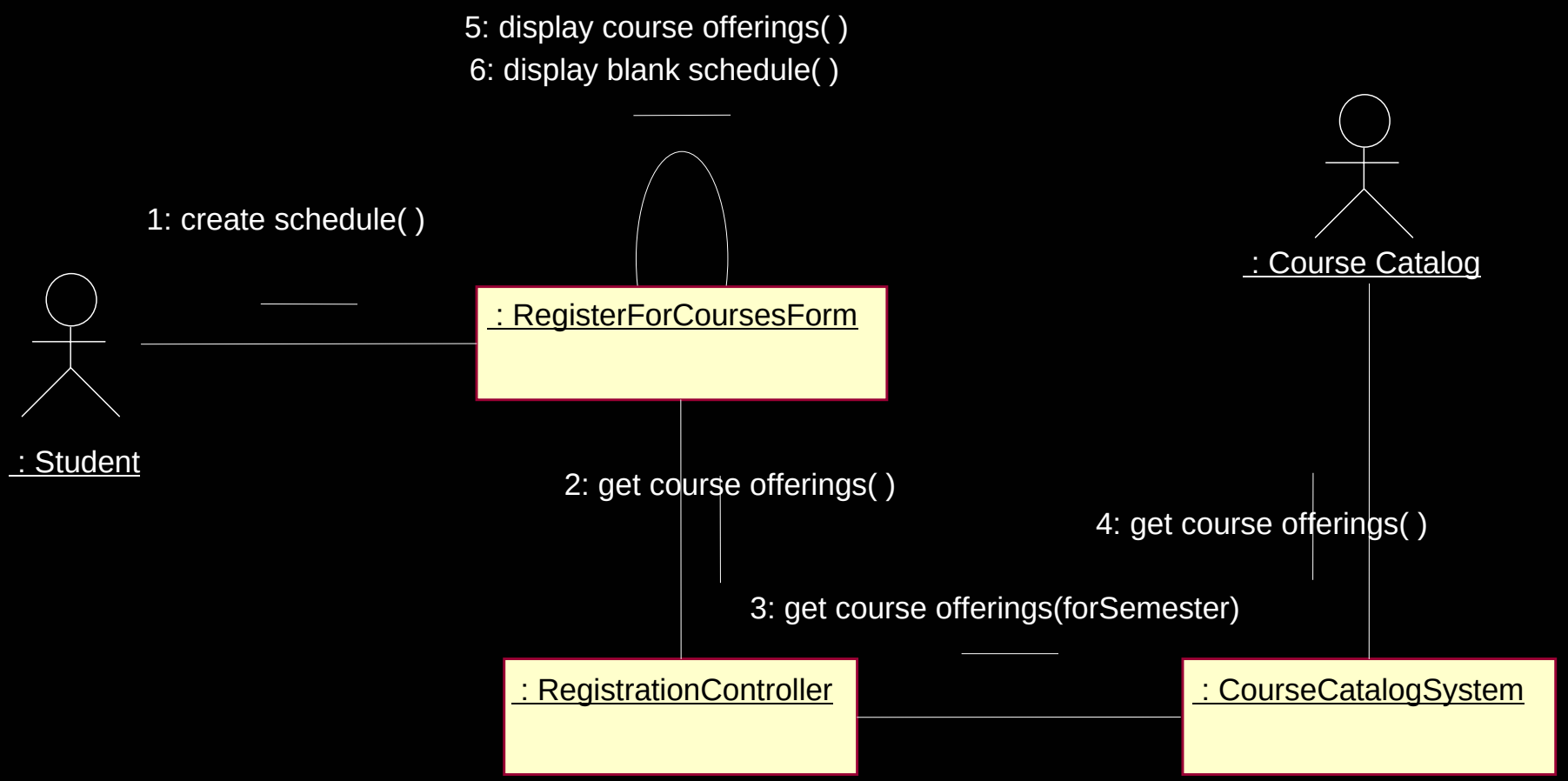
What Is a Collaboration Diagram?

- A collaboration diagram emphasizes the organization of the objects that participate in an interaction.
- The collaboration diagram shows:
  - The objects participating in the interaction.
  - Links between the objects.
  - Messages passed between the objects.

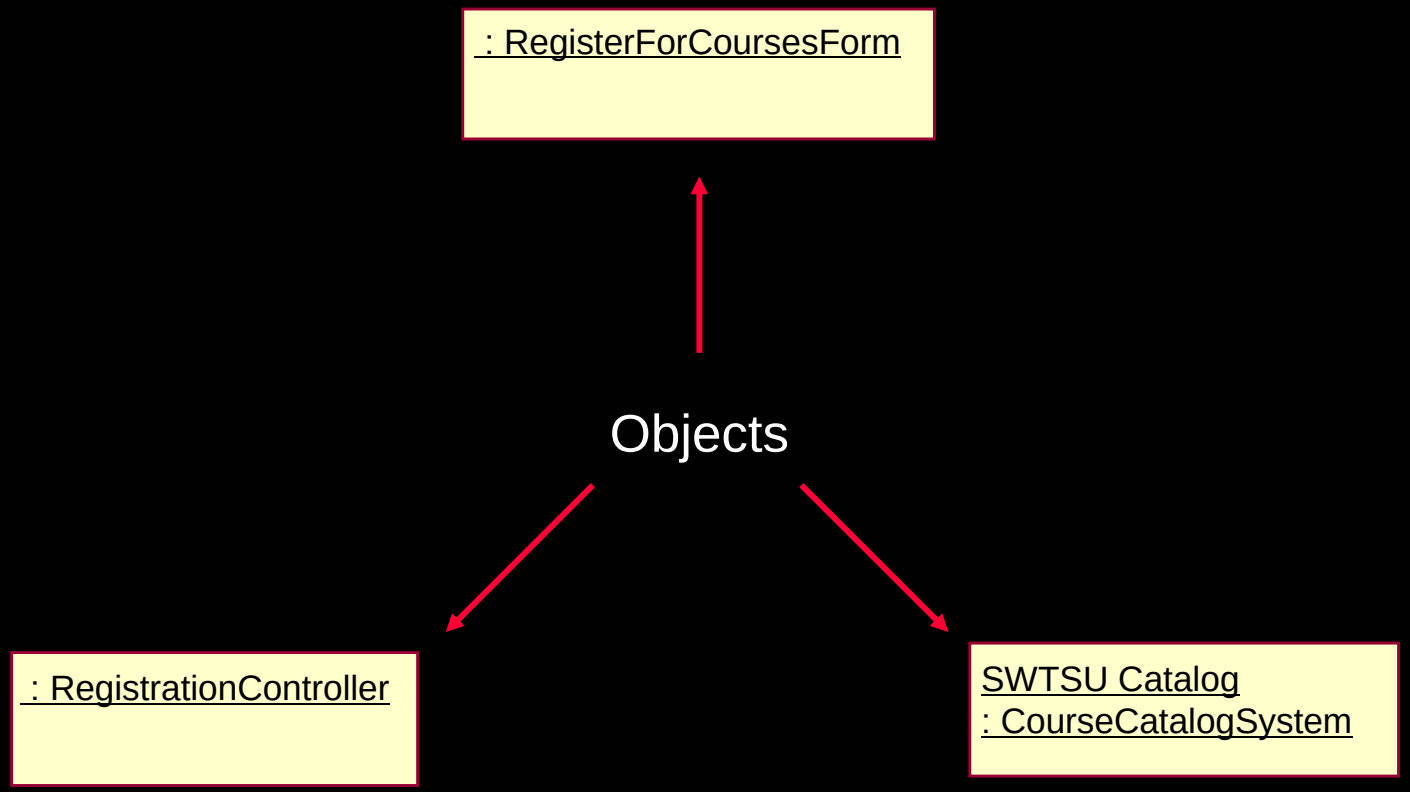


Collaboration Diagrams

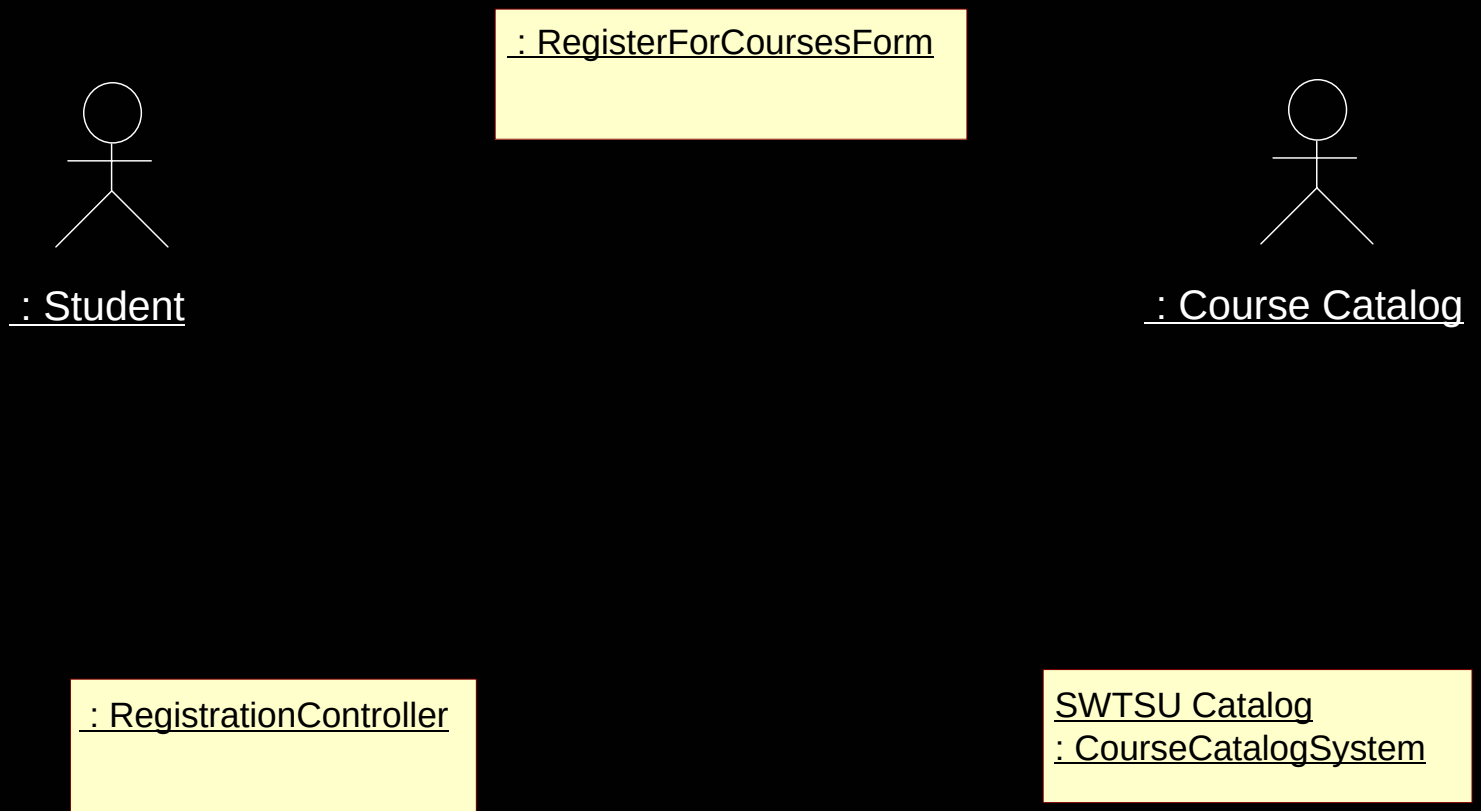
Example: Collaboration Diagram



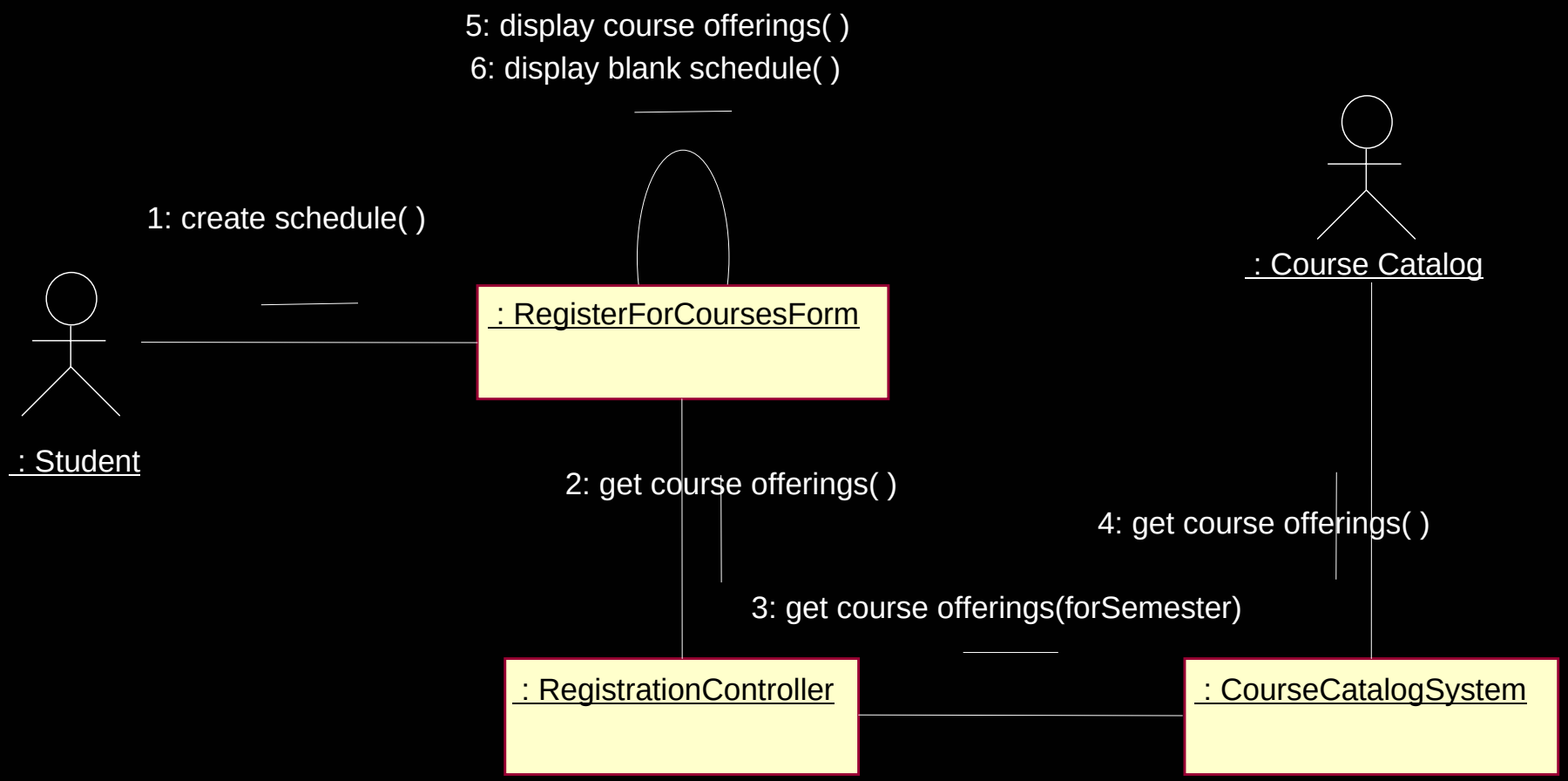
Collaboration Diagrams Contents: Objects



Collaboration Diagram Contents: Actors



Collaboration Diagram Contents: Links and Messages



Where Are We?

- Sequence diagrams
- Collaboration diagrams
- ★ Interaction diagram comparison

Sequence and Collaboration Diagram Similarities

- Semantically equivalent
  - Can convert one diagram to the other without losing any information
- Model the dynamic aspects of a system
- Model a use-case scenario

Sequence and Collaboration Diagram Differences

- Collaboration diagrams
  - Show relationships in addition to interactions
  - Better for visualizing patterns of collaboration
  - Better for visualizing all of the effects on a given object
  - Easier to use for brainstorming sessions
- Sequence diagrams
  - Show the explicit sequence of messages
  - Show focus of control
  - Better for visualizing overall flow
  - Better for real-time specifications and for complex scenarios

Review

- What is the purpose of an interaction diagram?
- What is a sequence diagram? A collaboration diagram?
- What are the similarities between sequence and collaboration diagrams?
- What are the differences between sequence and collaboration diagrams?

Exercise

- Given:
  - A set of objects and their links and messages
- Produce:
  - A sequence diagram
  - A collaboration diagram