

CS 417/505

Design Patterns

UML Modeling part 3

Dr. Chad Williams
Central Connecticut State University

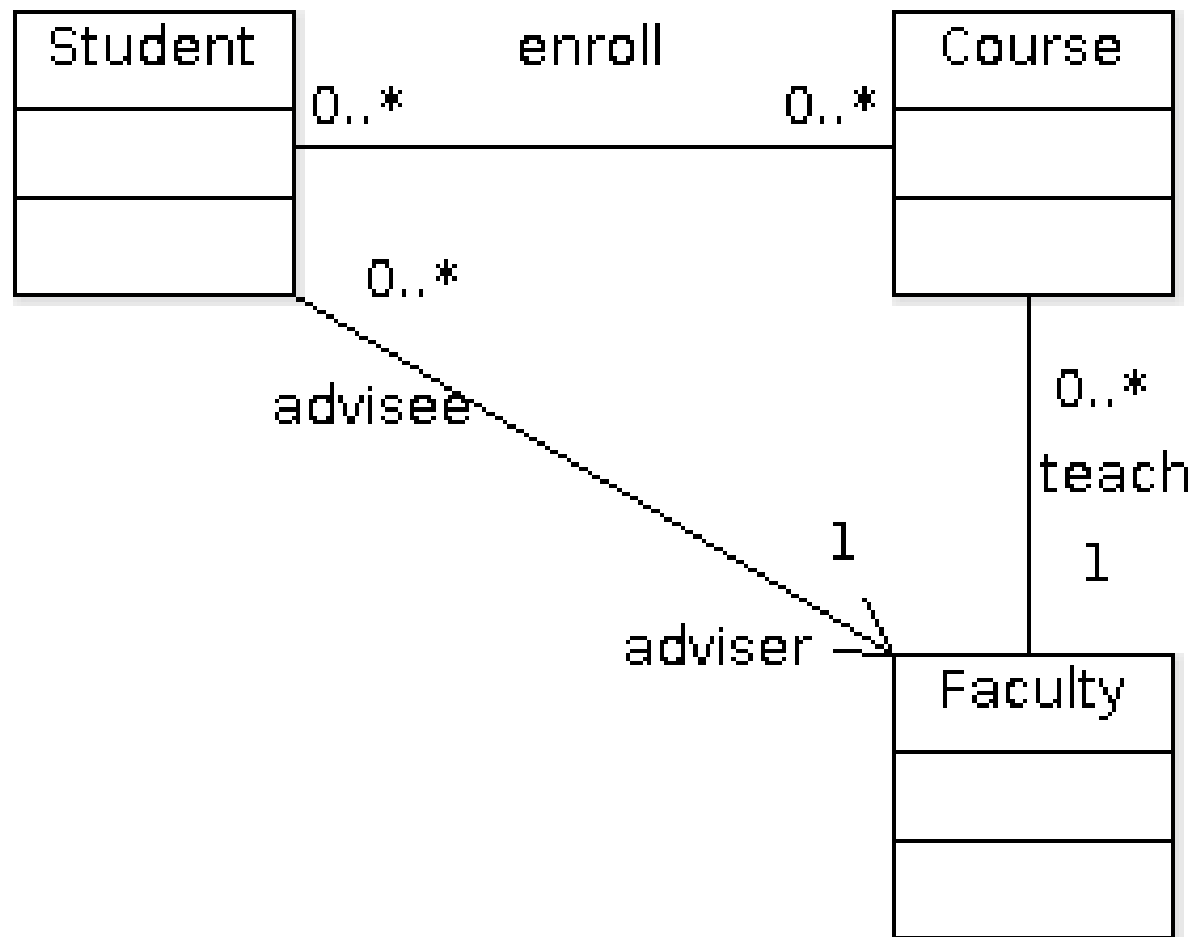
Topics

- Association
- Aggregation
- Composition
- Dependency

Association

- Represents a relationship between classes
 - Role name between classes
 - Multiplicity of relationship between classes
 - Navigability of relationship

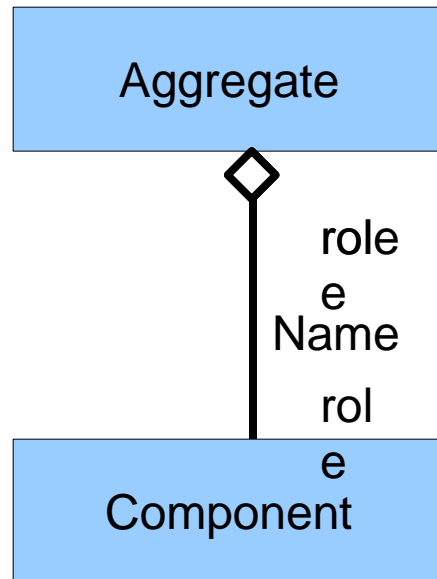
Sample association



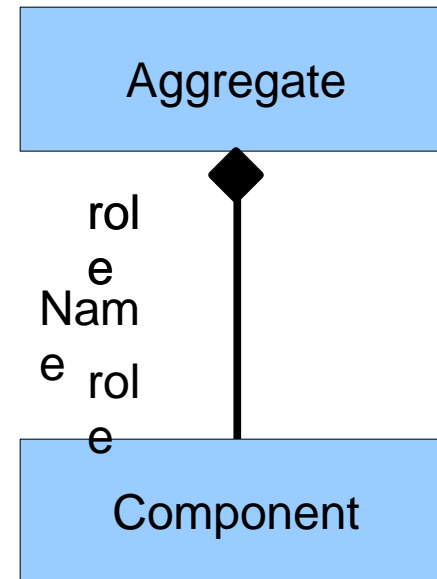
Aggregation and composition

- Aggregation - special form of association
 - Has-a or part-whole
 - Aggregate class form parts of component class
- Composition – stronger form of aggregation
 - The lifetime of the aggregate class is contained by component class

Graphical representation

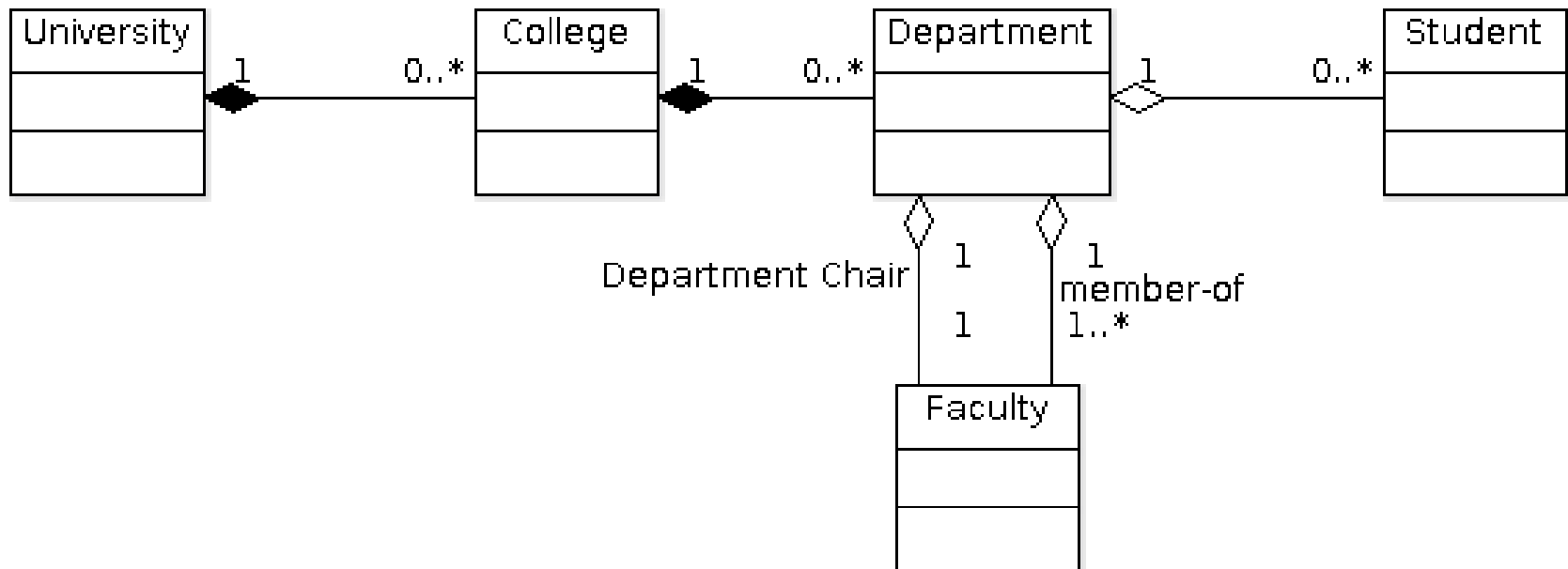


Aggregation
n



Composition
n

Aggregation example

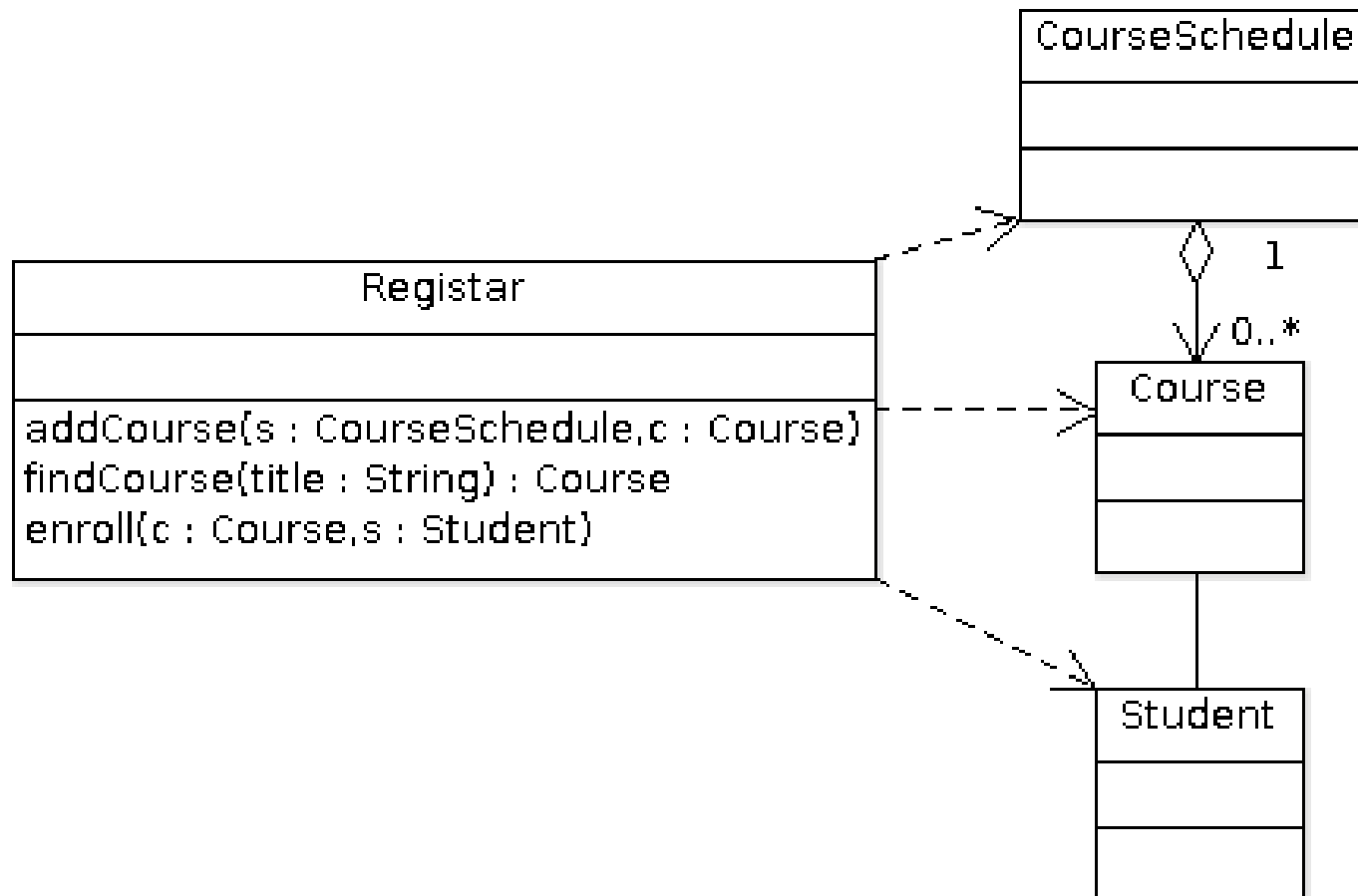


Dependency

- Represents proper operation of one class dependent on another class
- Common form is class being used as parameter or local variable

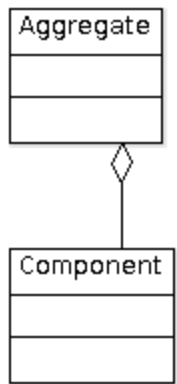


Dependency example

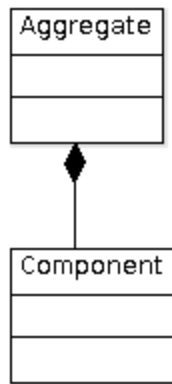


Group work

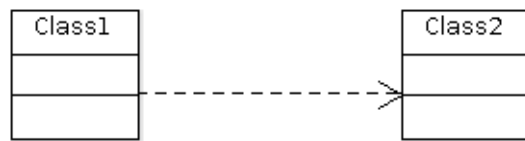
- Create an object model of a company
 - Multiple departments each with multiple workers
 - A worker can be either an employee or an intern, where the employee and intern classes are mutually exclusive (i.e. Worker should be an interface)
 - Head of each department is a manager
 - Manager is specialization of an employee
 - Employee has 0 or more addresses and the employee has a link to address but not vice versa
 - HumanResources class has operations to create employees and managers and assign them to departments. It also maintains a list of all employees
- Draw the following where applicable:
 - Inheritance, realization, association/aggregation/composition, dependency, numerocity



aggregation



composition



dependency

