# GradeBook

CSCI 5234 - Web Security Adam Vaughan Spring 2009

#### About GradeBook

- 3-Tiered Web Application
- Demonstrates Role-based Access Control
  - 4 Roles: Administrator, Teacher, Student, Parent
  - Areas of the application are limited by role
- Demonstrated using two virtual machines, one running the application server, the other running the database server

#### User Interface

- Implemented using Java Server Faces (JSF)
  - Chosen for adherence to MVC, ease of development
- Prototype JavaScript toolkit
- Communication between client and application server secured by SSL.

## Middle Tier

- Application server provided by Apache Tomcat
- Inversion of Control container provided by Spring Framework
  - Manages life-cycle of Java objects
- Hibernate for object-relational mapping (ORM)
  - Maps object-oriented model to relational database

## Backend

- MySQL relational database management system compiled with SSL enabled
- Interaction handled by Hibernate
- Communication between middle-tier and database secured by SSL
- User account created so SSL connections are required

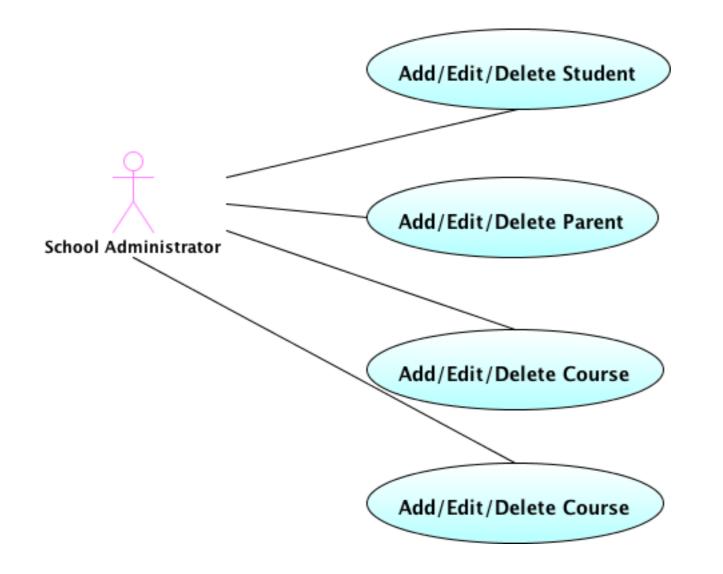
## User Class Diagram

User
Attributes
private long serialVersionUID = 1L
private String username
private String password
private String role
private String firstName
private String lastName
private String middleName
private String suffix
Operations
public User( )
public String getUsername( )
public void setUsername(String username)
public String getPassword( )
public void setPassword( String password )
public String getRole( )
public void setRole(String role)
public String getFirstName( )
public void setFirstName(String firstName)
public String getLastName( )
public void setLastName(String lastName)
public String getMiddleName( )
public void setMiddleName(String middleName)
public String getSuffix( )
public void setSuffix(String suffix)
public School getSchool( )
public void setSchool(School school)
public String getFullName( )

## Administrator Class Diagram

Administrator
Attributes
private long serialVersionUID = 1L
Operations
public Administrator( )

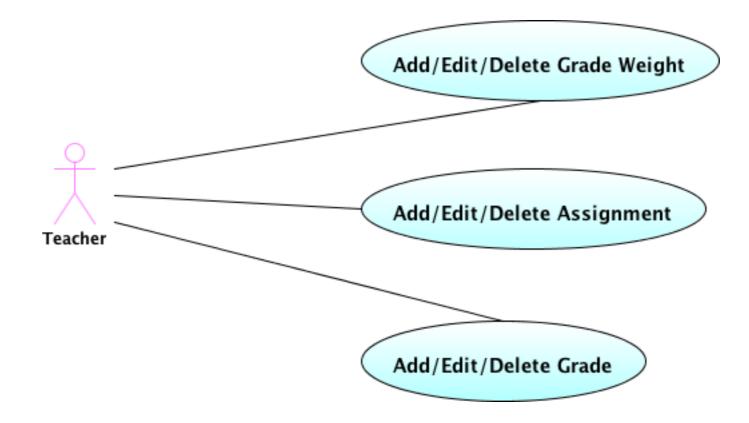
#### Administrator Use Case Diagram



## Teacher Class Diagram

Teacher
Attributes
private long serialVersionUID = 1L
Operations
public Teacher( )
public Course[0*] getCourses( )
public void setCourses( Course courses[0*] )
public void addCourse( Course course )
public void removeCourse( Course course )

#### Teacher Use Case Diagram



## Student Class Diagram

<b>Student</b>
Attributes
private long serialVersionUID = 1L
private int gradeLevel
Operations
public Student( )
public Course[0*] getCourses( )
public void setCourses( Course courses[0*] )
public Parent[0*] getParents( )
public void setParents( Parent parents[0*] )
public int getGradeLevel( )
public void setGradeLevel( int gradeLevel )
public void addParent( Parent parent )
public void removeParent( Parent parent )
public void addCourse( Course course )
public void removeCourse( Course course )

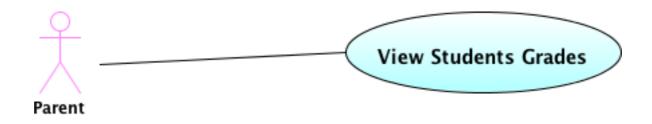
#### Student Use Case Diagram



#### Parent Class Diagram

Parent
Attributes
private long serialVersionUID = 1L
Operations
public Parent( )
public Student[0*] getStudents( )
public void setStudents( Student students[0*] )
public void addStudent( Student student )
public void removeStudent( Student student )

#### Parent Use Case Diagram



## School Class Diagram

School
Attributes
private long serialVersionUID = 1L
private String name
Operations
public School( )
public String getName( )
public void setName(String name)
public Administrator getAdministrator()
public void setAdministrator( Administrator administrator )
public Teacher[0*] getTeachers( )
public void setTeachers( Teacher teachers[0*] )
public Student[0*] getStudents( )
public void setStudents( Student students[0*] )
public Course[0*] getCourses( )
public void setCourses( Course courses[0*] )
public Parent[0*] getParents( )
public void setParents( Parent parents[0*] )
public void addTeacher( Teacher teacher )
public void removeTeacher( Teacher teacher )
public void addStudent( Student student )
public void removeStudent( Student student )
public void addCourse( Course course )
public void removeCourse( Course course )
public void addParent( Parent parent )
public void removeParent( Parent parent )

#### Course Class Diagram

Course
Attributes
private long serialVersionUID = $1L$
private int schoolYear
private String name
private String description
Operations
public Course( )
public School getSchool( )
public void setSchool(School school)
public int getSchoolYear( )
public void setSchoolYear(int schoolYear)
public String getName( )
public void setName( String name )
public String getDescription()
public void setDescription(String description)
public Teacher getTeacher( )
public void setTeacher( Teacher teacher )
public Student[0*] getStudents( )
public void setStudents( Student students[0*] )
public Assignment[0*] getAssignments( )
public void setAssignments( Assignment assignments[0*] )
public GradeWeight[0*] getGradeWeights( )
public void setGradeWeights(GradeWeight gradeWeights[0*])
public void addStudent( Student student )
public void removeStudent( Student student )
public void addGradeWeight(GradeWeight gradeWeight)
public void removeGradeWeight(GradeWeight gradeWeight)

## Grade Class Diagram

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Attributes
private long serialVersionUID = $1L$
private int grade
Operations
public Grade( )
public int getGrade( )
public void setGrade( int grade )
public Student getStudent( )
public void setStudent( Student student )
public Assignment getAssignment()
public void setAssignment( Assignment assignment )

## GradeWeight Class Diagram

GradeWeight
Attributes
private long serialVersionUID = 1L
private String assignmentType
private int weight
Operations
public GradeWeight( )
public Course getCourse( )
public void setCourse( Course course )
public String getAssignmentType()
public void setAssignmentType(String assignmentType)
public int getWeight( )
public void setWeight( int weight )

## Assignment Class Diagram

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	Assignment 📃
	Attributes
	private long serialVersionUID = $1L$
	private String name
	private String description
	private String type
	Operations
	public Assignment( )
	public Course getCourse()
	public void setCourse( Course course )
	public String getName( )
	public void setName(String name)
	public String getDescription()
	public void setDescription(String description)
	public String getType()
	public void setType(String type)
	public Grade[0*] getGrades( )
	public void setGrades(Grade grades[0*])

#### Data Model

