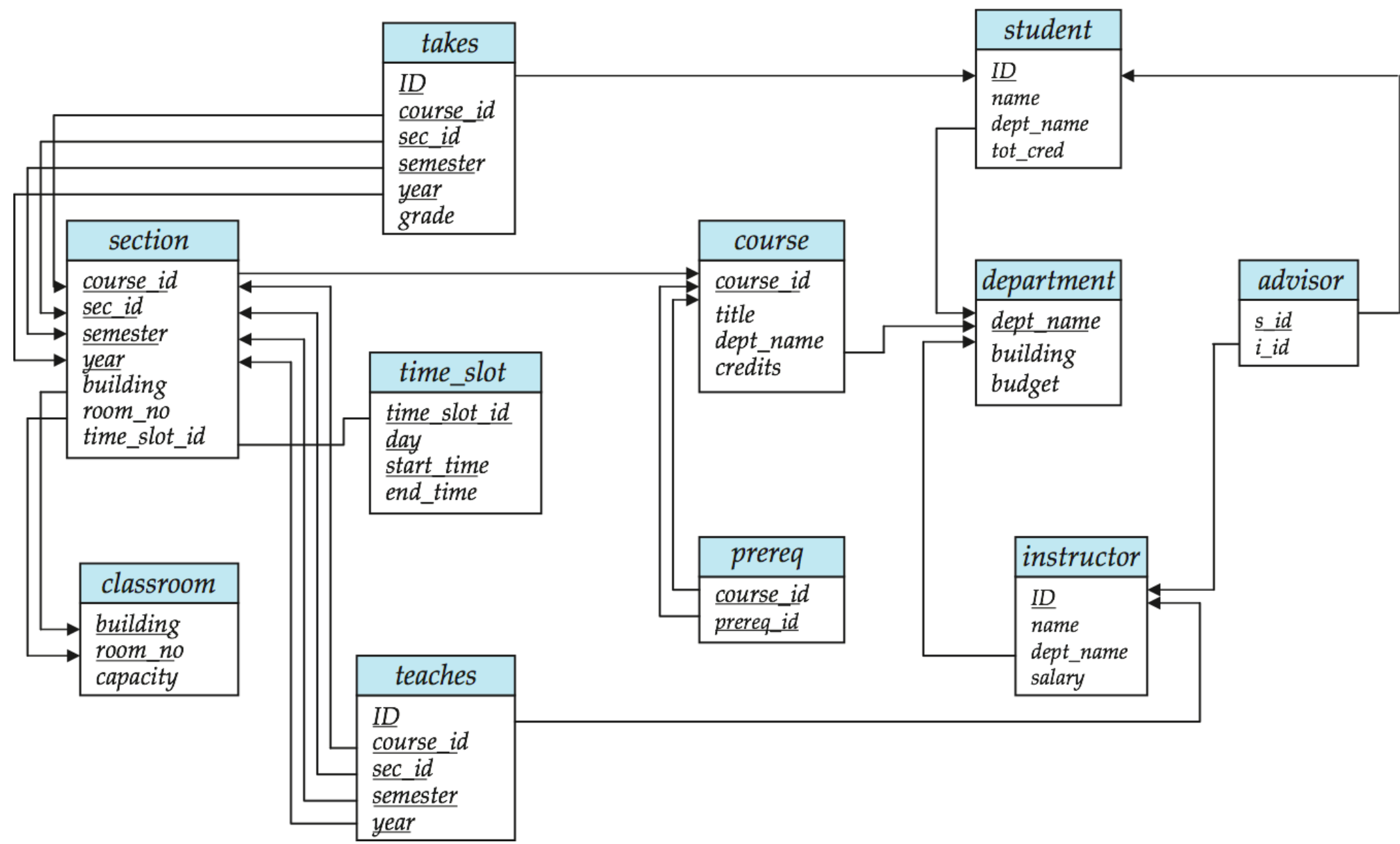


# University Database

Schema and Instances

# Schema Diagram for University Database



*classroom*(building, room\_number, capacity)  
*department*(dept\_name, building, budget)  
*course*(course\_id, title, dept\_name, credits)  
*instructor*(ID, name, dept\_name, salary)  
*section*(course\_id, sec\_id, semester, year, building, room\_number, time\_slot\_id)  
*teaches*(ID, course\_id, sec\_id, semester, year)  
*student*(ID, name, dept\_name, tot\_cred)  
*takes*(ID, course\_id, sec\_id, semester, year, grade)  
*advisor*(s\_ID, i\_ID)  
*time\_slot*(time\_slot\_id, day, start\_time, end\_time)  
*prereq*(course\_id, prereq\_id)

**Figure 2.9** Schema of the university database.

Figure 2.02: The Course relation

| <i>course_id</i> | <i>title</i>               | <i>dept_name</i> | <i>credits</i> |
|------------------|----------------------------|------------------|----------------|
| BIO-101          | Intro. to Biology          | Biology          | 4              |
| BIO-301          | Genetics                   | Biology          | 4              |
| BIO-399          | Computational Biology      | Biology          | 3              |
| CS-101           | Intro. to Computer Science | Comp. Sci.       | 4              |
| CS-190           | Game Design                | Comp. Sci.       | 4              |
| CS-315           | Robotics                   | Comp. Sci.       | 3              |
| CS-319           | Image Processing           | Comp. Sci.       | 3              |
| CS-347           | Database System Concepts   | Comp. Sci.       | 3              |
| EE-181           | Intro. to Digital Systems  | Elec. Eng.       | 3              |
| FIN-201          | Investment Banking         | Finance          | 3              |
| HIS-351          | World History              | History          | 3              |
| MU-199           | Music Video Production     | Music            | 3              |
| PHY-101          | Physical Principles        | Physics          | 4              |

Figure 2.03: The Pre-requisite relation

| <i>course_id</i> | <i>prereq_id</i> |
|------------------|------------------|
| BIO-301          | BIO-101          |
| BIO-399          | BIO-101          |
| CS-190           | CS-101           |
| CS-315           | CS-101           |
| CS-319           | CS-101           |
| CS-347           | CS-101           |
| EE-181           | PHY-101          |

Figure 2.05: The Department Relation

| <i>dept_name</i> | <i>building</i> | <i>budget</i> |
|------------------|-----------------|---------------|
| Biology          | Watson          | 90000         |
| Comp. Sci.       | Taylor          | 100000        |
| Elec. Eng.       | Taylor          | 85000         |
| Finance          | Painter         | 120000        |
| History          | Painter         | 50000         |
| Music            | Packard         | 80000         |
| Physics          | Watson          | 70000         |

Figure 2.04: The Instructor relation

| <i>ID</i> | <i>name</i> | <i>dept_name</i> | <i>salary</i> |
|-----------|-------------|------------------|---------------|
| 22222     | Einstein    | Physics          | 95000         |
| 12121     | Wu          | Finance          | 90000         |
| 32343     | El Said     | History          | 60000         |
| 45565     | Katz        | Comp. Sci.       | 75000         |
| 98345     | Kim         | Elec. Eng.       | 80000         |
| 76766     | Crick       | Biology          | 72000         |
| 10101     | Srinivasan  | Comp. Sci.       | 65000         |
| 58583     | Califieri   | History          | 62000         |
| 83821     | Brandt      | Comp. Sci.       | 92000         |
| 15151     | Mozart      | Music            | 40000         |
| 33456     | Gold        | Physics          | 87000         |
| 76543     | Singh       | Finance          | 80000         |



Figure 2.06: The Section relation

| <i>course_id</i> | <i>sec_id</i> | <i>semester</i> | <i>year</i> | <i>building</i> | <i>room_number</i> | <i>time_slot_id</i> |
|------------------|---------------|-----------------|-------------|-----------------|--------------------|---------------------|
| BIO-101          | 1             | Summer          | 2009        | Painter         | 514                | B                   |
| BIO-301          | 1             | Summer          | 2010        | Painter         | 514                | A                   |
| CS-101           | 1             | Fall            | 2009        | Packard         | 101                | H                   |
| CS-101           | 1             | Spring          | 2010        | Packard         | 101                | F                   |
| CS-190           | 1             | Spring          | 2009        | Taylor          | 3128               | E                   |
| CS-190           | 2             | Spring          | 2009        | Taylor          | 3128               | A                   |
| CS-315           | 1             | Spring          | 2010        | Watson          | 120                | D                   |
| CS-319           | 1             | Spring          | 2010        | Watson          | 100                | B                   |
| CS-319           | 2             | Spring          | 2010        | Taylor          | 3128               | C                   |
| CS-347           | 1             | Fall            | 2009        | Taylor          | 3128               | A                   |
| EE-181           | 1             | Spring          | 2009        | Taylor          | 3128               | C                   |
| FIN-201          | 1             | Spring          | 2010        | Packard         | 101                | B                   |
| HIS-351          | 1             | Spring          | 2010        | Painter         | 514                | C                   |
| MU-199           | 1             | Spring          | 2010        | Packard         | 101                | D                   |
| PHY-101          | 1             | Fall            | 2009        | Watson          | 100                | A                   |

Figure 2.07: The Teaches relation

| <i>ID</i> | <i>course_id</i> | <i>sec_id</i> | <i>semester</i> | <i>year</i> |
|-----------|------------------|---------------|-----------------|-------------|
| 10101     | CS-101           | 1             | Fall            | 2009        |
| 10101     | CS-315           | 1             | Spring          | 2010        |
| 10101     | CS-347           | 1             | Fall            | 2009        |
| 12121     | FIN-201          | 1             | Spring          | 2010        |
| 15151     | MU-199           | 1             | Spring          | 2010        |
| 22222     | PHY-101          | 1             | Fall            | 2009        |
| 32343     | HIS-351          | 1             | Spring          | 2010        |
| 45565     | CS-101           | 1             | Spring          | 2010        |
| 45565     | CS-319           | 1             | Spring          | 2010        |
| 76766     | BIO-101          | 1             | Summer          | 2009        |
| 76766     | BIO-301          | 1             | Summer          | 2010        |
| 83821     | CS-190           | 1             | Spring          | 2009        |
| 83821     | CS-190           | 2             | Spring          | 2009        |
| 83821     | CS-319           | 2             | Spring          | 2010        |
| 98345     | EE-181           | 1             | Spring          | 2009        |

| ID    | name     | dept_name  | tot_cred |
|-------|----------|------------|----------|
| 00128 | Zhang    | Comp. Sci. | 102      |
| 12345 | Shankar  | Comp. Sci. | 32       |
| 19991 | Brandt   | History    | 80       |
| 23121 | Chavez   | Finance    | 110      |
| 44553 | Peltier  | Physics    | 56       |
| 45678 | Levy     | Physics    | 46       |
| 54321 | Williams | Comp. Sci. | 54       |
| 55739 | Sanchez  | Music      | 38       |
| 70557 | Snow     | Physics    | 0        |
| 76543 | Brown    | Comp. Sci. | 58       |
| 76653 | Aoi      | Elec. Eng. | 60       |
| 98765 | Bourikas | Elec. Eng. | 98       |
| 98988 | Tanaka   | Biology    | 120      |

**Figure A.9** The *student* relation.

| ID    | course_id | sec_id | semester | year | grade |
|-------|-----------|--------|----------|------|-------|
| 00128 | CS-101    | 1      | Fall     | 2009 | A     |
| 00128 | CS-347    | 1      | Fall     | 2009 | A-    |
| 12345 | CS-101    | 1      | Fall     | 2009 | C     |
| 12345 | CS-190    | 2      | Spring   | 2009 | A     |
| 12345 | CS-315    | 1      | Spring   | 2010 | A     |
| 12345 | CS-347    | 1      | Fall     | 2009 | A     |
| 19991 | HIS-351   | 1      | Spring   | 2010 | B     |
| 23121 | FIN-201   | 1      | Spring   | 2010 | C+    |
| 44553 | PHY-101   | 1      | Fall     | 2009 | B-    |
| 45678 | CS-101    | 1      | Fall     | 2009 | F     |
| 45678 | CS-101    | 1      | Spring   | 2010 | B+    |
| 45678 | CS-319    | 1      | Spring   | 2010 | B     |
| 54321 | CS-101    | 1      | Fall     | 2009 | A-    |
| 54321 | CS-190    | 2      | Spring   | 2009 | B+    |
| 55739 | MU-199    | 1      | Spring   | 2010 | A-    |
| 76543 | CS-101    | 1      | Fall     | 2009 | A     |
| 76543 | CS-319    | 2      | Spring   | 2010 | A     |
| 76653 | EE-181    | 1      | Spring   | 2009 | C     |
| 98765 | CS-101    | 1      | Fall     | 2009 | C-    |
| 98765 | CS-315    | 1      | Spring   | 2010 | B     |
| 98988 | BIO-101   | 1      | Summer   | 2009 | A     |
| 98988 | BIO-301   | 1      | Summer   | 2010 | null  |

**Figure A.10** The *takes* relation.



| <i>s_id</i> | <i>i_id</i> |
|-------------|-------------|
| 00128       | 45565       |
| 12345       | 10101       |
| 23121       | 76543       |
| 44553       | 22222       |
| 45678       | 22222       |
| 76543       | 45565       |
| 76653       | 98345       |
| 98765       | 98345       |
| 98988       | 76766       |

**Figure A.11** The *advisor* relation.

| <i>time_slot_id</i> | <i>day</i> | <i>start_time</i> | <i>end_time</i> |
|---------------------|------------|-------------------|-----------------|
| A                   | M          | 8:00              | 8:50            |
| A                   | W          | 8:00              | 8:50            |
| A                   | F          | 8:00              | 8:50            |
| B                   | M          | 9:00              | 9:50            |
| B                   | W          | 9:00              | 9:50            |
| B                   | F          | 9:00              | 9:50            |
| C                   | M          | 11:00             | 11:50           |
| C                   | W          | 11:00             | 11:50           |
| C                   | F          | 11:00             | 11:50           |
| D                   | M          | 13:00             | 13:50           |
| D                   | W          | 13:00             | 13:50           |
| D                   | F          | 13:00             | 13:50           |
| E                   | T          | 10:30             | 11:45           |
| E                   | R          | 10:30             | 11:45           |
| F                   | T          | 14:30             | 15:45           |
| F                   | R          | 14:30             | 15:45           |
| G                   | M          | 16:00             | 16:50           |
| G                   | W          | 16:00             | 16:50           |
| G                   | F          | 16:00             | 16:50           |
| H                   | W          | 10:00             | 12:30           |

**Figure A.12** The *time\_slot* relation.

| <i>course_id</i> | <i>prereq_id</i> |
|------------------|------------------|
| BIO-301          | BIO-101          |
| BIO-399          | BIO-101          |
| CS-190           | CS-101           |
| CS-315           | CS-101           |
| CS-319           | CS-101           |
| CS-347           | CS-101           |
| EE-181           | PHY-101          |

**Figure A.13** The *prereq* relation.

| <i>time_slot_id</i> | <i>day</i> | <i>start_hr</i> | <i>start_min</i> | <i>end_hr</i> | <i>end_min</i> |
|---------------------|------------|-----------------|------------------|---------------|----------------|
| A                   | M          | 8               | 0                | 8             | 50             |
| A                   | W          | 8               | 0                | 8             | 50             |
| A                   | F          | 8               | 0                | 8             | 50             |
| B                   | M          | 9               | 0                | 9             | 50             |
| B                   | W          | 9               | 0                | 9             | 50             |
| B                   | F          | 9               | 0                | 9             | 50             |
| C                   | M          | 11              | 0                | 11            | 50             |
| C                   | W          | 11              | 0                | 11            | 50             |
| C                   | F          | 11              | 0                | 11            | 50             |
| D                   | M          | 13              | 0                | 13            | 50             |
| D                   | W          | 13              | 0                | 13            | 50             |
| D                   | F          | 13              | 0                | 13            | 50             |
| E                   | T          | 10              | 30               | 11            | 45             |
| E                   | R          | 10              | 30               | 11            | 45             |
| F                   | T          | 14              | 30               | 15            | 45             |
| F                   | R          | 14              | 30               | 15            | 45             |
| G                   | M          | 16              | 0                | 16            | 50             |
| G                   | W          | 16              | 0                | 16            | 50             |
| G                   | F          | 16              | 0                | 16            | 50             |
| H                   | W          | 10              | 0                | 12            | 30             |

**Figure A.14** The *time\_slot* relation with start and end time separated into hour and minute.