

a)

```
SELECT DISTINCT s.ID, s.name
FROM student AS s
JOIN takes AS t ON s.ID = t.ID
WHERE t.semester = 'Spring' AND t.year = 2009;
```

b)

```
SELECT DISTINCT t.ID
FROM takes AS t
JOIN teaches AS te
  ON t.course_id = te.course_id
  AND t.sec_id = te.sec_id
  AND t.semester = te.semester
  AND t.year = te.year
JOIN instructor AS i
  ON te.ID = i.ID
WHERE i.name = 'Einstein';
```

c)

```
SELECT DISTINCT s.name
FROM student AS s
JOIN takes AS t ON s.ID = t.ID
JOIN course AS c ON c.course_id = t.course_id
WHERE c.dept_name = 'Comp. Sci.';
```

d)

```
SELECT course_id, title
FROM course
WHERE dept_name = 'Biology'
ORDER BY course_id;
```

e)

-- PERSON

```
CREATE TABLE person (
    driver_id VARCHAR(20) PRIMARY KEY,
    name    VARCHAR(100) NOT NULL,
    address VARCHAR(200)
);
```

-- CAR

```
CREATE TABLE car (
    vin  VARCHAR(17) PRIMARY KEY,
    model VARCHAR(100) NOT NULL,
    year SMALLINT CHECK (year >= 1886) -- first car year sanity check
);
```

-- ACCIDENT

```
CREATE TABLE accident (
    report_id VARCHAR(20) PRIMARY KEY,
    date    DATE NOT NULL,
    location VARCHAR(200)
```

```
);
```

```
-- OWNS
```

```
CREATE TABLE owns (
```

```
    driver_id VARCHAR(20) NOT NULL,
```

```
    vin    VARCHAR(17) NOT NULL,
```

```
    PRIMARY KEY (driver_id, vin),
```

```
    FOREIGN KEY (driver_id) REFERENCES person(driver_id)
```

```
        ON UPDATE CASCADE ON DELETE CASCADE,
```

```
    FOREIGN KEY (vin)    REFERENCES car(vin)
```

```
        ON UPDATE CASCADE ON DELETE CASCADE
```

```
);
```

```
-- PARTICIPATED
```

```
CREATE TABLE participated (
```

```
    report_id VARCHAR(20) NOT NULL,
```

```
    vin    VARCHAR(17) NOT NULL,
```

```
    driver_id VARCHAR(20) NOT NULL,
```

```
    damage_amt DECIMAL(12,2) NOT NULL DEFAULT 0,
```

```
    PRIMARY KEY (report_id, vin, driver_id),
```

```
    FOREIGN KEY (report_id) REFERENCES accident(report_id)
```

```
        ON UPDATE CASCADE ON DELETE CASCADE,
```

```
    FOREIGN KEY (vin)    REFERENCES car(vin)
```

```
        ON UPDATE CASCADE ON DELETE CASCADE,
```

```
    FOREIGN KEY (driver_id) REFERENCES person(driver_id)
```

```
        ON UPDATE CASCADE ON DELETE CASCADE
```

);