Steps 1 and 2:

Students:

```
mysql> create table bkp5190_students(sid mediumint(9) NOT NULL, lname varchar(20) NOT
NULL, fname varchar(20) NOT NULL, loginid varchar(20) NOT NULL, CONSTRAINT PRI PRIMARY
KEY (sid));
Query OK, 0 rows affected (0.02 sec)

mysql> describe bkp5190_students;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| sid     | mediumint(9) | NO  | PRI | NULL    |       |
| lname   | varchar(20) | NO   |     | NULL    |       |
| fname   | varchar(20) | NO   |     | NULL    |       |
| loginid | varchar(20) | NO   |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
mysql> SELECT * FROM bkp5190_students;
+------+---------+----------+---------+
| sid  | lname   | fname    | loginid |
+------+---------+----------+---------+
| 9001 | Adam    | Apple    | AXA101  |
| 9002 | Betty   | Boop     | BXB101  |
| 9003 | Charlie | Chaplin  | CXC101  |
| 9004 | Debbie  | Donohue  | DXD101  |
| 9005 | Ellen   | Eggbert  | EXE101  |
| 9006 | Frank   | Fontaine | FXF101  |
| 9007 | George  | Gorgeous | GXG101  |
| 9008 | Harry   | Hanlin   | HXH101  |
| 9009 | Izzy    | Iceland  | IXI101  |
| 9010 | Jerry   | Jarhead  | JXJ101  |
+------+---------+----------+---------+
10 rows in set (0.00 sec)
```

Classes:

```
mysql> create table bkp5190_classes(cid mediumint(9) NOT NULL, cname varchar(20) NOT
NULL, ctype varchar(20) NOT NULL, numcredits float NOT NULL, CONSTRAINT PRI PRIMARY
KEY (cid));
Query OK, 0 rows affected (0.35 sec)
mysql> describe bkp5190_classes;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| cid        | mediumint(9) | NO  | PRI | NULL    |       |
| cname      | varchar(20) | NO   |     | NULL    |       |
| ctype      | varchar(20) | NO   |     | NULL    |       |
| numcredits | float       | NO   |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
```

4 rows in set (0.00 sec)

```
mysql> SELECT * FROM bkp5190_classes;
+------+-------+--------+------------+
| cid  | cname | ctype  | numcredits |
+------+-------+--------+------------+
| 8001 | 465   | CMPSC  |          3 |
| 8002 | 202c  | ENG    |          3 |
| 8003 | 464   | CMPSC  |          3 |
| 8004 | 201   | CMPSC  |          3 |
| 8005 | 15    | ENG    |          3 |
| 8006 | 211   | PHYS   |          3 |
| 8007 | 101   | HEALTH |        1.5 |
+------+-------+--------+------------+
7 rows in set (0.00 sec)
```

Taken:

```
mysql> create table bkp5190_taken(tid mediumint(9) NOT NULL, sid int(11) NOT NULL, cid
int(11) NOT NULL, semester varchar(10) NOT NULL, grade varchar(5) NOT NULL, iid
int(11) NOT NULL, CONSTRAINT PRI PRIMARY KEY (tid));
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> describe bkp5190_taken;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| tid      | mediumint(9) | NO   | PRI | NULL    |       |
| sid      | int(11)      | NO   |     | NULL    |       |
| cid      | int(11)      | NO   |     | NULL    |       |
| semester | varchar(10)  | NO   |     | NULL    |       |
| grade    | varchar(5)   | NO   |     | NULL    |       |
| iid      | int(11)      | NO   |     | NULL    |       |
+----------+--------------+------+-----+---------+-------+
6 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM bkp5190_taken;
+-------+------+------+----------+-------+------+
| tid   | sid  | cid  | semester | grade | iid  |
+-------+------+------+----------+-------+------+
| 98760 | 9009 | 8005 | 18 FA    | C+    | 6002 |
| 98761 | 9007 | 8006 | 17 SP    | A     | 6001 |
| 98762 | 9008 | 8001 | 18 FA    | F     | 6004 |
| 98763 | 9008 | 8007 | 18 FA    | D     | 6002 |
| 98764 | 9007 | 8002 | 18 FA    | C+    | 6003 |
| 98765 | 9007 | 8005 | 18 FA    | B-    | 6003 |
| 98766 | 9007 | 8004 | 17 SP    | B     | 6004 |
| 98767 | 9003 | 8003 | 17 SP    | B+    | 6004 |
| 98768 | 9002 | 8002 | 17 SP    | A-    | 6003 |
| 98769 | 9002 | 8001 | 17 SP    | A     | 6004 |
+-------+------+------+----------+-------+------+
10 rows in set (0.00 sec)
```

Grade Points:

```
mysql> create table bkp5190_grade_points(grade varchar(5) NOT NULL, points float NOT
NULL);
Query OK, 0 rows affected (0.04 sec)

mysql> describe bkp5190_grade_points;
+--------+------------+------+-----+---------+-------+
| Field  | Type       | Null | Key | Default | Extra |
+--------+------------+------+-----+---------+-------+
| grade  | varchar(5) | NO   |     | NULL    |       |
| points | float      | NO   |     | NULL    |       |
+--------+------------+------+-----+---------+-------+
2 rows in set (0.00 sec)

mysql> SELECT * FROM bkp5190_grade_points;
+-------+--------+
| grade | points |
+-------+--------+
| A     |      4 |
| A-    |   3.67 |
| B+    |   3.33 |
| B     |      3 |
| B-    |   2.67 |
| C+    |   2.33 |
| C     |      2 |
| D     |      1 |
| F     |      0 |
+-------+--------+
9 rows in set (0.00 sec)
```

Instructors:

```
mysql> create table bkp5190_instructors(iid mediumint(9) NOT NULL, lname varchar(20)
NOT NULL, fname varchar(20) NOT NULL, loginid varchar(20) NOT NULL, department
varchar(20) NOT NULL, title varchar(20) NOT NULL, CONSTRAINT PRI PRIMARY KEY (iid));
Query OK, 0 rows affected (0.02 sec)

mysql> describe bkp5190_instructors;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| iid        | mediumint(9) | NO   | PRI | NULL    |       |
| lname      | varchar(20)  | NO   |     | NULL    |       |
| fname      | varchar(20)  | NO   |     | NULL    |       |
| loginid    | varchar(20)  | NO   |     | NULL    |       |
| department | varchar(20)  | NO   |     | NULL    |       |
| title      | varchar(30)  | NO   |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
6 rows in set (0.00 sec)
```
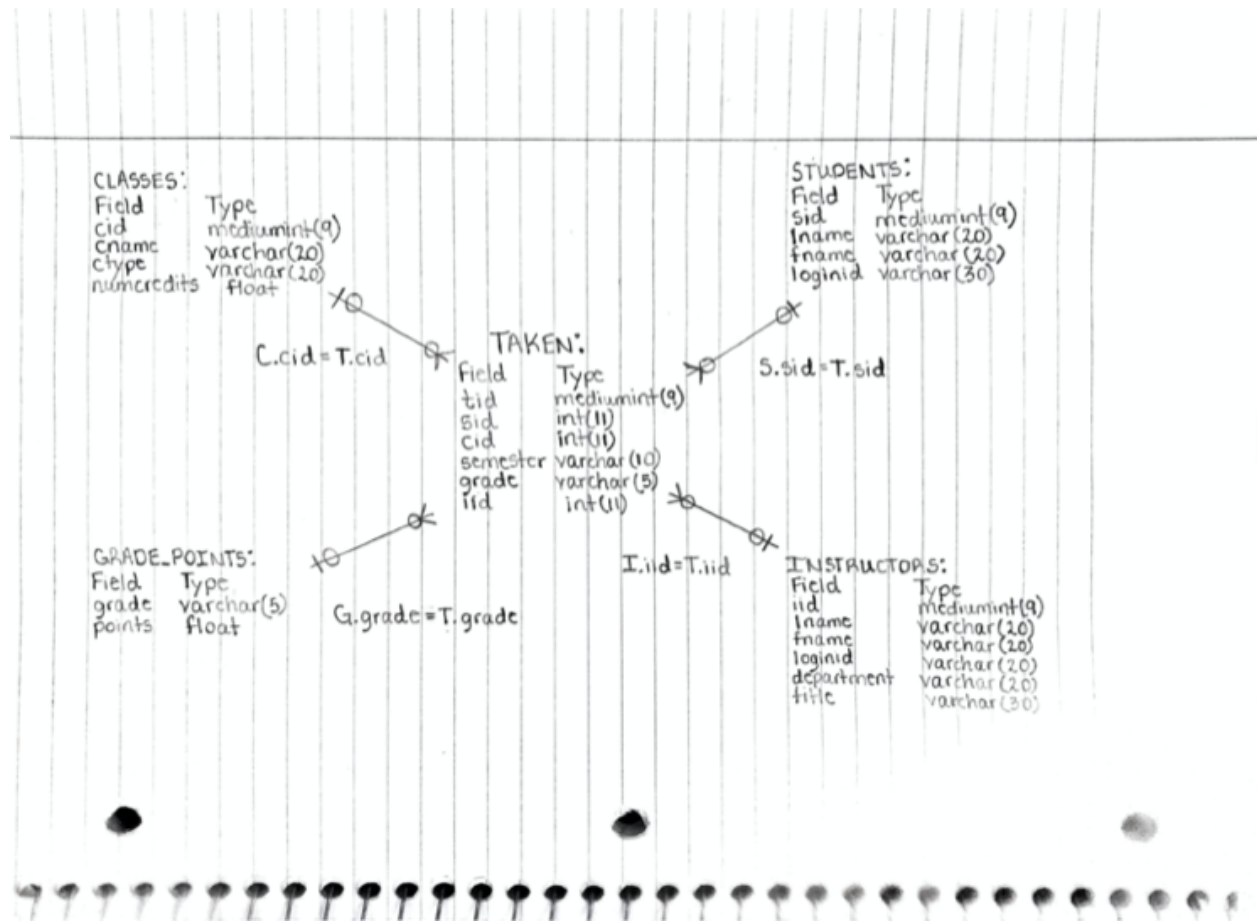
```
mysql> SELECT * FROM bkp5190_instructors;
+------+---------------+--------+---------+------------+----------------------+
| iid  | lname         | fname  | loginid | department | title                |
+------+---------------+--------+---------+------------+----------------------+
| 6001 | Einstein      | Albert | AXE1001 | PHYS       | Professor            |
| 6002 | Schwarzenegger | Arnold | BXL1001 | HEALTH     | Professor of Practice |
| 6003 | Whitman       | Walt   | WXW1001 | ENG        | Associate Professor  |
| 6004 | Codd          | Edgar  | EXC1001 | CMPSC      | Professor            |
+------+---------------+--------+---------+------------+----------------------+
4 rows in set (0.00 sec)
```

Step 3:

CLASSES:
Field   Type
cid   mediumint(9)
cname   varchar(20)
ctype   varchar(20)
numcredits float

STUDENTS:
Field   Type
sid   mediumint(9)
lname   varchar(20)
fname   varchar(20)
loginid varchar(30)

TAKEN:
Field   Type
tid   mediumint(9)
sid   int(11)
cid   int(11)
semester varchar(10)
grade   varchar(5)
iid   int(11)

C.cid = T.cid

S.sid = T.sid

GRADE_POINTS:
Field Type
grade varchar(5)
points float

G.grade = T.grade

I.iid = T.iid

INSTRUCTORS:
Field   Type
iid   mediumint(9)
lname   varchar(20)
fname   varchar(20)
loginid   varchar(20)
department varchar(20)
title   varchar(30)

Step 4:

4.1

```
mysql> SELECT C.ctype, C.cname, T.semester, I.fname, I.lname, I.title FROM
bkp5190_classes C, bkp5190_taken T, bkp5190_instructors I WHERE C.cid = T.cid AND
I.iid = T.iid ORDER BY semester;
```

```
+--------+-------+----------+--------+---------------+----------------------+
| ctype  | cname | semester | fname  | lname         | title                |
+--------+-------+----------+--------+---------------+----------------------+
| CMPSC  | 201   | 17 SP    | Edgar  | Codd          | Professor            |
| ENG    | 202c  | 17 SP    | Walt   | Whitman       | Associate Professor  |
| PHYS   | 211   | 17 SP    | Albert | Einstein      | Professor            |
| CMPSC  | 464   | 17 SP    | Edgar  | Codd          | Professor            |
| CMPSC  | 465   | 17 SP    | Edgar  | Codd          | Professor            |
| ENG    | 15    | 18 FA    | Arnold | Schwarzenegger | Professor of Practice |
| CMPSC  | 465   | 18 FA    | Edgar  | Codd          | Professor            |
| ENG    | 202c  | 18 FA    | Walt   | Whitman       | Associate Professor  |
| HEALTH | 101   | 18 FA    | Arnold | Schwarzenegger | Professor of Practice |
| ENG    | 15    | 18 FA    | Walt   | Whitman       | Associate Professor  |
+--------+-------+----------+--------+---------------+----------------------+
10 rows in set (0.01 sec)
```

4.2

```
mysql> mysql> SELECT SUM(C.numcredits) AS "Credit Hours", T.semester, I.fname, I.lname
FROM bkp5190_classes C, bkp5190_taken T, bkp5190_instructors I WHERE C.cid = T.cid AND
I.iid = T.iid GROUP BY T.semester, I.fname, I.lname;
```

```
+--------------+----------+--------+----------------+
| Credit Hours | semester | fname  | lname          |
+--------------+----------+--------+----------------+
|            3 | 17 SP    | Albert | Einstein       |
|            9 | 17 SP    | Edgar  | Codd           |
|            3 | 17 SP    | Walt   | Whitman        |
|          4.5 | 18 FA    | Arnold | Schwarzenegger |
|            3 | 18 FA    | Edgar  | Codd           |
|            6 | 18 FA    | Walt   | Whitman        |
+--------------+----------+--------+----------------+
6 rows in set (0.00 sec)
```

4.3

```
mysql> SELECT T.semester, I.fname, I.lname, SUM(C.numcredits) AS "Credit Hours" FROM
bkp5190_classes C, bkp5190_taken T, bkp5190_instructors I WHERE C.cid = T.cid AND
I.iid = T.iid AND I.department != C.ctype GROUP BY T.semester, I.fname, I.lname;
```

```
+----------+--------+----------------+--------------+
| semester | fname  | lname          | Credit Hours |
+----------+--------+----------------+--------------+
| 18 FA    | Arnold | Schwarzenegger |            3 |
+----------+--------+----------------+--------------+
```

1 row in set (0.00 sec)

4.4

mysql> <mark>SELECT S.fname, S.lname, AVG((C.numcredits*G.points)/C.numcredits) AS "GPA" FROM bkp5190_classes C, bkp5190_taken T, bkp5190_grade_points G, bkp5190_students S WHERE S.sid = T.sid AND T.cid = C.cid AND G.grade = T.grade GROUP BY S.fname, S.lname;</mark>

```
+----------+---------+--------------------+
| fname    | lname   | GPA                |
+----------+---------+--------------------+
| Boop     | Betty   | 3.8350000381469727 |
| Chaplin  | Charlie | 3.3299999237060547 |
| Gorgeous | George  |                  3 |
| Hanlin   | Harry   |                0.5 |
| Iceland  | Izzy    | 2.3299999237060547 |
+----------+---------+--------------------+
5 rows in set (0.01 sec)
```

4.5

mysql> <mark>SELECT C.ctype, C.cname, MAX(G.points) FROM bkp5190_classes C, bkp5190_grade_points G, bkp5190_taken T WHERE T.cid = C.cid AND T.grade = G.grade GROUP BY C.ctype, C.cname;</mark>

```
+--------+-------+---------------+
| ctype  | cname | MAX(G.points) |
+--------+-------+---------------+
| CMPSC  | 201   |             3 |
| CMPSC  | 464   |          3.33 |
| CMPSC  | 465   |             4 |
| ENG    | 15    |          2.67 |
| ENG    | 202c  |          3.67 |
| HEALTH | 101   |             1 |
| PHYS   | 211   |             4 |
+--------+-------+---------------+
7 rows in set (0.00 sec)
```