ITSE 2309
LAB #3
Mark Newman
Enclosed: Newman_lab3.sql, Newman_lab3_output.txt

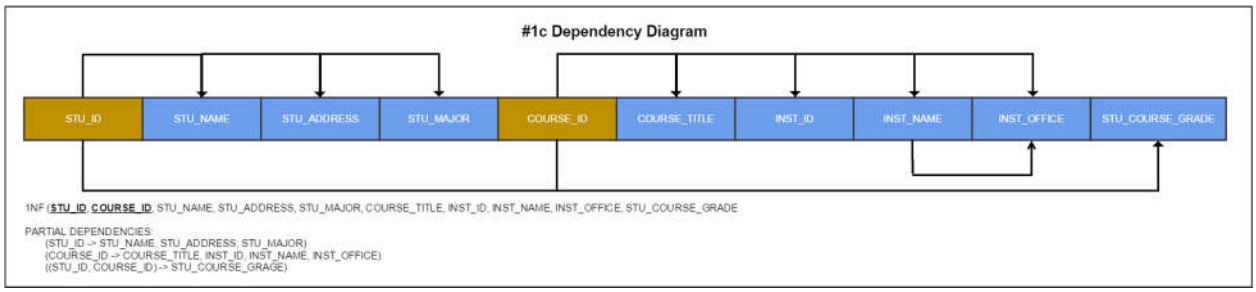
#1a: Identify the Primary Key of the table as it is currently shown.

PK: (STU_ID, COURSE_ID)

#1b: Identify all of the functional dependencies.

STU_ID -> STU_NAME, STU_ADDRESS, STU_MAJOR
COURSE_ID -> COURSE_TITLE, INST_ID, INST_NAME, INST_OFFICE
(STU_ID, COURSE_ID) -> STU_COURSE_GRADE

#1c: Dependency Diagram



#2a: List of normalized table descriptions

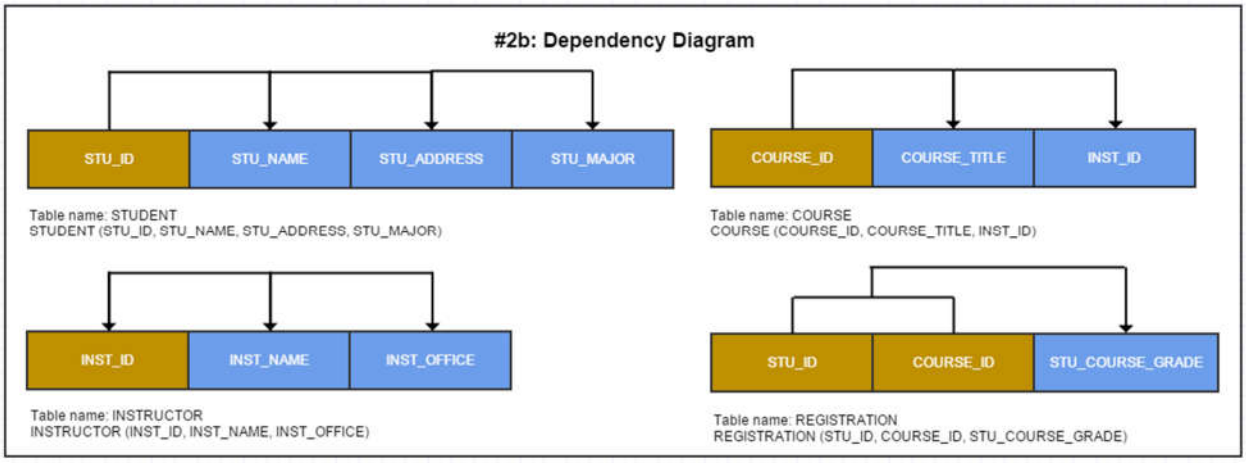
STU
pk STU_ID
   STU_NAME
   STU_ADDRESS
   STU_MAJOR

INSTRUCTOR
 pk INST_ID
    INST_NAME
    INST_OFFICE

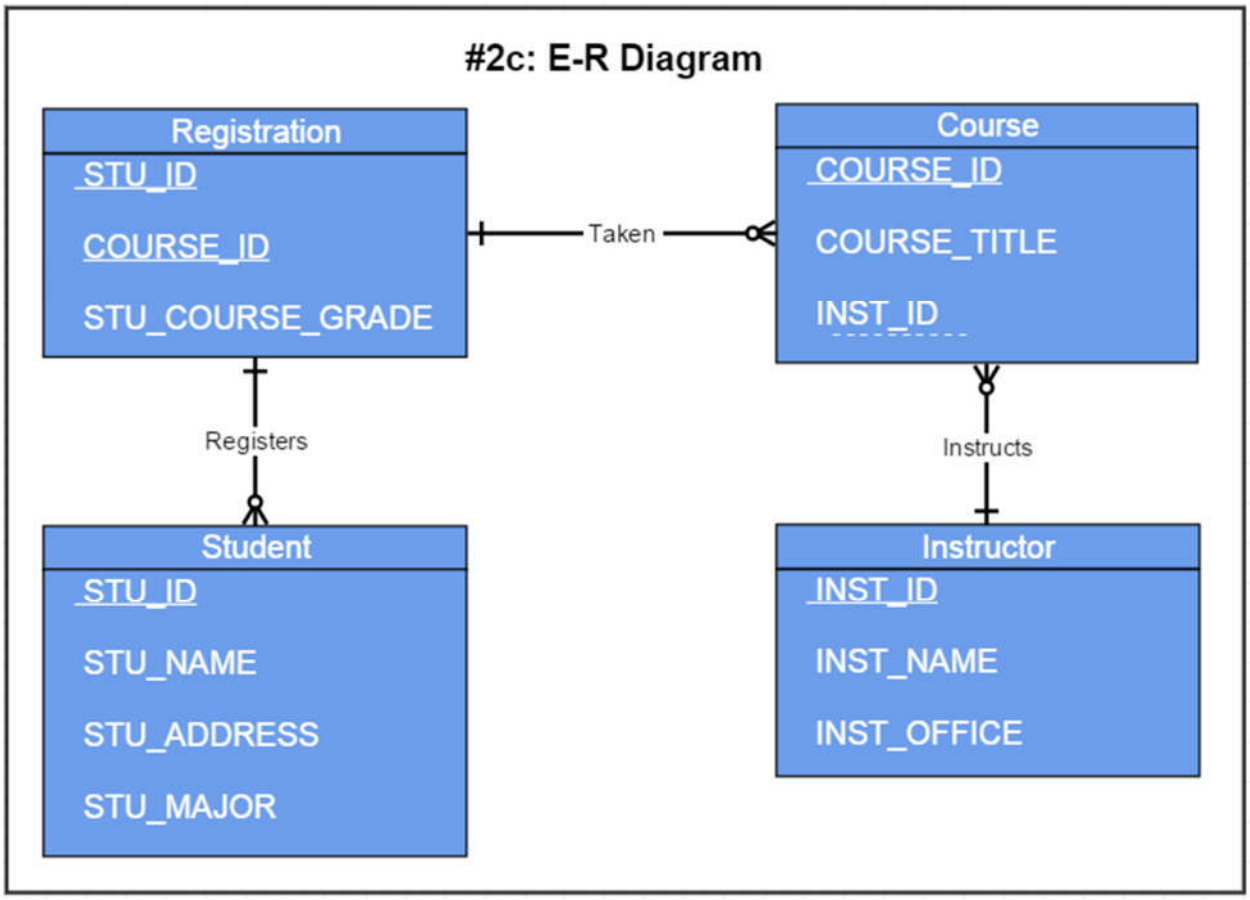
COURSE
 pk COURSE_ID
    COURSE_TITLE
 fk INST_ID

REGISTRATION
pk STU_ID
pk COURSE_ID
STU_COURSE_GRADE

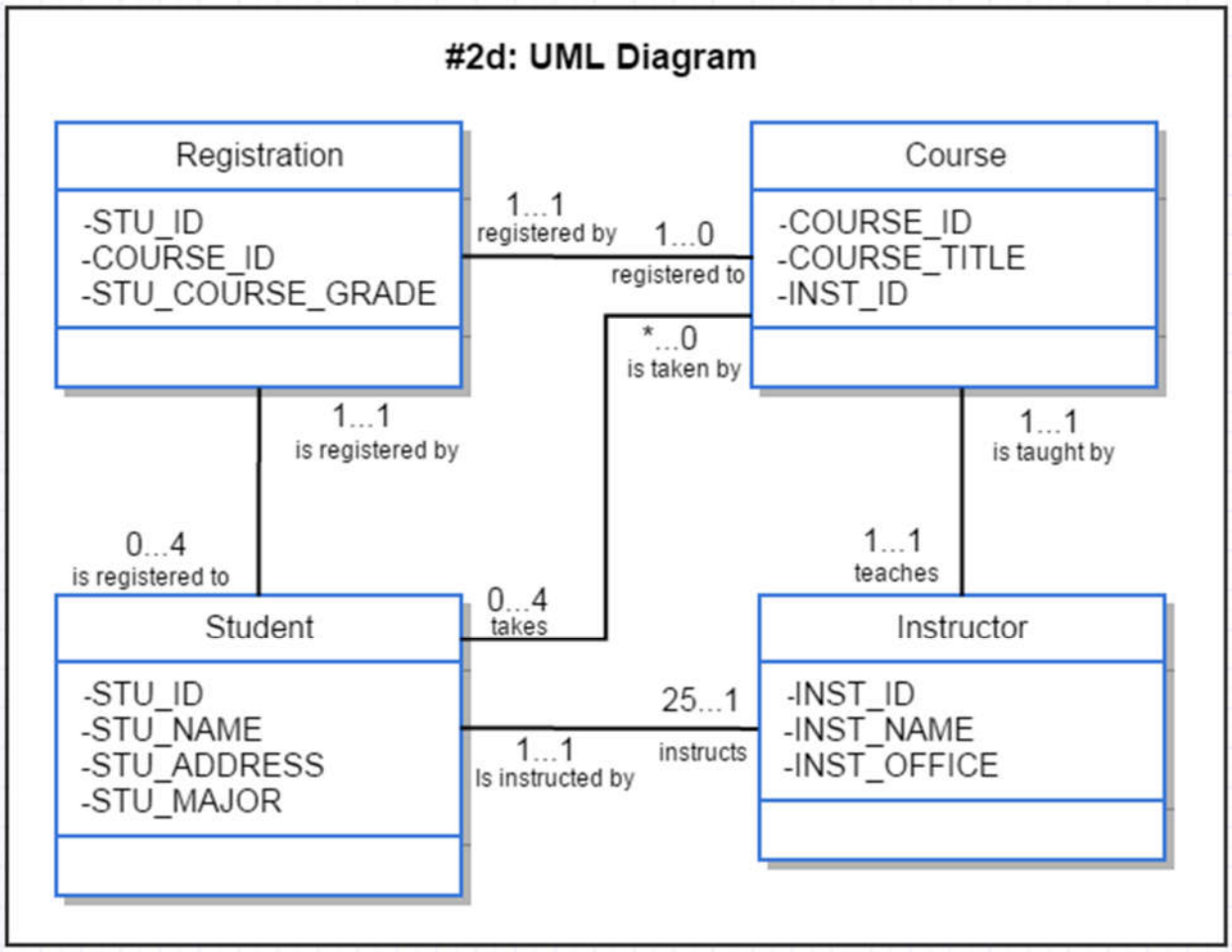
#2b: Dependency diagrams for the normalized tables



#2c: E-R diagram of the tables to be created



#2d: UML diagram of the tables to be created



Output for #4 and #5

```
SQL> SET LINESIZE 180
SQL> SET PAGESIZE 180
SQL> -- #4
SQL> CREATE TABLE STU
  (STU_ID       NUMBER(9) CONSTRAINT STU_ID_pk PRIMARY KEY,
   STU_NAME     CHAR(20)  CONSTRAINT STU_NAME_nn NOT NULL,
   STU_ADDRESS  VARCHAR2(20),
   STU_MAJOR    VARCHAR2(10)
   );

Table STU created.

SQL> DESC STU;

Name        Null     Type
----------- -------- ------------
STU_ID      NOT NULL NUMBER(9)
STU_NAME    NOT NULL CHAR(20)
STU_ADDRESS          VARCHAR2(20)
STU_MAJOR            VARCHAR2(10)
SQL> CREATE TABLE INSTRUCTOR
  (INST_ID      NUMBER(3) CONSTRAINT INST_ID_pk PRIMARY KEY,
   INST_NAME    CHAR(20)  CONSTRAINT INST_NAME_nn NOT NULL,
   INST_OFFICE  VARCHAR2(4)
   );

Table INSTRUCTOR created.

SQL> DESC INSTRUCTOR;

Name        Null     Type
----------- -------- -----------
INST_ID     NOT NULL NUMBER(3)
INST_NAME   NOT NULL CHAR(20)
INST_OFFICE          VARCHAR2(4)
SQL> CREATE TABLE COURSE
  (COURSE_ID     VARCHAR2(7) CONSTRAINT COURSE_ID_pk PRIMARY KEY,
   COURSE_TITLE  VARCHAR2(30),
   INST_ID       NUMBER(3),
   FOREIGN KEY (INST_ID)
      REFERENCES INSTRUCTOR (INST_ID)
  );

Table COURSE created.

SQL> DESC COURSE;

Name         Null     Type
------------ -------- ------------
COURSE_ID    NOT NULL VARCHAR2(7)
COURSE_TITLE          VARCHAR2(30)
INST_ID               NUMBER(3)
SQL> CREATE TABLE REGISTRATION
  (STU_ID       NUMBER(9),
   COURSE_ID    VARCHAR2(7),
   STU_COURSE_GRADE  CHAR(1)  CHECK (STU_COURSE_GRADE IN ('A', 'B', 'C', 'D', 'F')),
   PRIMARY KEY (STU_ID, COURSE_ID)
   );

Table REGISTRATION created.
```

```
SQL> DESC REGISTRATION;

Name             Null     Type
---------------- -------- -----------
STU_ID           NOT NULL NUMBER(9)
COURSE_ID        NOT NULL VARCHAR2(7)
STU_COURSE_GRADE          CHAR(1)
SQL> -- #5
SQL> INSERT INTO STU
  VALUES (268300458, 'Williams', '208 Brooks', 'CIS');

1 row inserted.

SQL> INSERT INTO STU
  VALUES (543291073,'Baker','104 Philips','Acct');

1 row inserted.

SQL> INSERT INTO STU
  VALUES (695381127,'White','208 Brooks','Math');

1 row inserted.

SQL> SELECT * FROM STU;

    STU_ID STU_NAME             STU_ADDRESS          STU_MAJOR
---------- -------------------- -------------------- ----------
 268300458 Williams             208 Brooks           CIS
 543291073 Baker                104 Philips          Acct
 695381127 White                208 Brooks           Math

SQL> INSERT INTO INSTRUCTOR
  VALUES (301,'Codd','B104');

1 row inserted.

SQL> INSERT INTO INSTRUCTOR
  VALUES (451,'Parsons','B317');

1 row inserted.

SQL> INSERT INTO INSTRUCTOR
  VALUES (255,'Miller','H310');

1 row inserted.

SQL> INSERT INTO INSTRUCTOR
  VALUES (518,'Bennett','B212');

1 row inserted.

SQL> INSERT INTO INSTRUCTOR
  VALUES (622,'Hilbert','M301');

1 row inserted.

SQL> SELECT * FROM INSTRUCTOR;

   INST_ID INST_NAME            INST
---------- -------------------- ----
       301 Codd                 B104
       451 Parsons              B317
       255 Miller               H310
       518 Bennett              B212
```

```
       622 Hilbert              M301

SQL> INSERT INTO COURSE
  VALUES ('CIS 350', 'Database', 301);

1 row inserted.

SQL> INSERT INTO COURSE
  VALUES ('CIS 465', 'Systems Anal', 451);

1 row inserted.

SQL> INSERT INTO COURSE
  VALUES ('Acc 201', 'Fund of Acctg.', 255);

1 row inserted.

SQL> INSERT INTO COURSE
  VALUES ('Mkt 300', 'Into to Mktg', 518);

1 row inserted.

SQL> INSERT INTO COURSE
  VALUES ('Mth 202', 'College algebra', 622);

1 row inserted.

SQL> SELECT * FROM COURSE;

COURSE_ COURSE_TITLE                    INST_ID
------- ----------------------------- ----------
CIS 350 Database                             301
CIS 465 Systems Anal                         451
Acc 201 Fund of Acctg.                       255
Mkt 300 Into to Mktg                         518
Mth 202 College algebra                      622

SQL> INSERT INTO REGISTRATION
  VALUES (268300458, 'CIS 350', 'A');

1 row inserted.

SQL> INSERT INTO REGISTRATION
  VALUES (268300458, 'CIS 465', 'B');

1 row inserted.

SQL> INSERT INTO REGISTRATION
  VALUES (543291073, 'CIS 350', 'C');

1 row inserted.

SQL> INSERT INTO REGISTRATION
  VALUES (543291073, 'Acc 201', 'B');

1 row inserted.

SQL> INSERT INTO REGISTRATION
  VALUES (543291073, 'Mkt 300', 'A');

1 row inserted.

SQL> INSERT INTO REGISTRATION
  VALUES (695381127, 'Mth 202', 'B');
```

```
1 row inserted.

SQL> INSERT INTO REGISTRATION
  VALUES (695381127, 'Acc 201', 'A');

1 row inserted.

SQL> SELECT * FROM REGISTRATION;

    STU_ID COURSE_ S
---------- ------- -
 268300458 CIS 350 A
 268300458 CIS 465 B
 543291073 CIS 350 C
 543291073 Acc 201 B
 543291073 Mkt 300 A
 695381127 Mth 202 B
 695381127 Acc 201 A

 7 rows selected

SQL> -- BONUS!
SQL> SELECT STU.STU_ID, STU.STU_NAME, STU.STU_ADDRESS, STU.STU_MAJOR, COURSE.COURSE_ID,
COURSE.COURSE_TITLE, INSTRUCTOR.INST_ID, INSTRUCTOR.INST_NAME, INSTRUCTOR.INST_OFFICE,
REGISTRATION.STU_COURSE_GRADE
FROM STU
INNER JOIN REGISTRATION
  ON STU.STU_ID = REGISTRATION.STU_ID
INNER JOIN COURSE
  ON REGISTRATION.COURSE_ID = COURSE.COURSE_ID
INNER JOIN INSTRUCTOR
  ON COURSE.INST_ID = INSTRUCTOR.INST_ID;

    STU_ID STU_NAME             STU_ADDRESS          STU_MAJOR  COURSE_ COURSE_TITLE                    INST_ID INST_NAME            INST S
---------- -------------------- -------------------- ---------- ------- ------------------------------ ---------- -------------------- ---- -
 268300458 Williams             208 Brooks           CIS        CIS 465 Systems Anal                        451 Parsons              B317 B
 268300458 Williams             208 Brooks           CIS        CIS 350 Database                            301 Codd                 B104 A
 543291073 Baker                104 Philips          Acct       Mkt 300 Into to Mktg                        518 Bennett              B212 A
 543291073 Baker                104 Philips          Acct       Acc 201 Fund of Acctg.                      255 Miller               H310 B
 543291073 Baker                104 Philips          Acct       CIS 350 Database                            301 Codd                 B104 C
 695381127 White                208 Brooks           Math       Acc 201 Fund of Acctg.                      255 Miller               H310 A
 695381127 White                208 Brooks           Math       Mth 202 College algebra                     622 Hilbert              M301 B

 7 rows selected

SQL> SET ECHO OFF
```