

[ MDLSIB023 ][ RBNNIC009 ][ SKSVPX001 ][ WHTDAV023 ]

a) - A person at UCT is either a student or an academic staff member.

b) ***\*\*PLEASE SEE ENTITY RELATIONSHIP MODEL DIAGRAM AT END OF DOCUMENT\*\****

c)

Person(IDNumber, Full Name, ContactNumber, PersonalEmail, Gender)

Staff( StaffID, Staff Email)

Student(StudentNumber, Student Email)

StudentMajors(StudentNumber, MajorCode)

Result(StudentNumber, CourseCode, Period)

Course(CourseCode, Prerequisite, NQFCredits, NQF level, Pass Grade)

Periods(CourseCode, Period)

CourseStaff(CourseCode, StaffID)

Major(MajorCode, Title)

MajorCourses(MajorCode, CourseCode)

TimeTable(period, courseCode, day)

d) Course Staff ID

e) Within the Person relation, IDNumber → Contact Number

f) A functional dependency describes the relationship between two attributes in a relation. For two attributes A and B to be functionally dependent, A must relate to exactly one value of B within the relation.

g) The Student relation has a major code which links it to the Major relation and the Major relation has a course code which links it to the Course relation. Therefore the Student is linked to the Course relation

h)

Sibusiso Madlala: Collaboratively created ER diagram, collaboratively created RDB diagram, answered theory questions.

Nicholas Rogers: Collaboratively created ER diagram, collaboratively created RDB diagram, collaboratively created extended ER diagram, answered theory questions.

Mikah Slabbert: Non-responsive, did not contribute.

Vusi Skosana: Collaboratively created ER diagram, collaboratively created RDB diagram, collaboratively created extended ER diagram, answered theory questions.

David White: Collaboratively created ER diagram, collaboratively created extended ER diagram, explained extended ER model in English.

i) ***\*\* PLEASE SEE EXTENDED ENTITY RELATIONSHIP MODEL DIAGRAM AT END OF DOCUMENT \*\****

This ER model describes a person entity, with attributes IDNumber, which is the primary key of this entity and is a frozen attribute: one cannot change their IDNumber, full name, contact number, gender and personal email. A person does not always have a contact number or personal email. A person entity at UCT is either a student entity or a staff entity or both in the case of a tutor. A student is not always a student; only as long as they are enrolled as a student at UCT. A student has attributes student number, which is the primary key of this entity and cannot be changed, and student email which is derived from the student number. A student is either an undergraduate student or a postgraduate student. Both types of students are not always that type. Undergraduate students may in future change to become postgraduate students and postgraduate students must have been undergraduate students in the past. A staff entity is only a staff entity while employed by UCT as such. A staff member has the primary key attribute of staffID and attribute staff email derived from staffID. A staff member is a tutor or a lecturer or a course convener but are not always of that type. A course convener must in the past have extended from a lecturer and a lecturer may in the future extend to be a course convener too. Additionally, a student may in the future extend to be a tutor too. A student has a timetable entity, which has the attributes day, period(primary key) and the course code of the lecture occurring during that period. A student takes one or more majors which have attributes title and MajorCode, the primary key, which do not change. A major requires one or more courses. Each course has the primary key attribute Course Code, which does not change, and other attributes: pass grade, NQF credits, NQF level, duration, which can be derived from the course code, periods which is multi-valued: a course may have lectures in more than one period, prerequisites which not every course has eg some first year courses. Each student has a results entity, which is existence dependent on the student entity. The results entity has the primary key student number, as well as the other attributes course code and grade for that particular course. Courses with prerequisites require certain results. Finally, every course is managed by a course convener.

### **Individually Answered Questions:**

Nicholas Rogers:

1. TREND. This system is extremely effective in creating an understandable structure in a short amount of time. This allows rapid feedback and iteration of design. Using english to describe the desired relationships is difficult to read quickly and isn't easily comprehensible. Therefore, for the sake of designing a relation based system, it would be more efficient to prototype using TREND.
2. TREND. TREND represents relationship centred systems visually making them more accessible and easier to understand. Having an intuitive understanding of a system from a visual display is advantageous for development of design or interpretation of data.
3. Fairly clear.
4. Ok but would take some time to get used to
5. CHG = EVOLVE or EVL while EXT = ADAPT or ADT
6. Somewhat confusing
7. As they are now.

Vusi Skosana:

1. TREND. Simple, not lengthy, very direct, and easy to understand. It's very easy to analyse and obtain relationships of the information given.
2. TREND. It is clear, and not as abstract as words in english could be.
3. OK but takes some getting used to
4. fairly clear
5. REP(REPLACE) for CHG & SUP(SUPPLEMENT) for EXT
6. fairly clear.
7. As they are now.

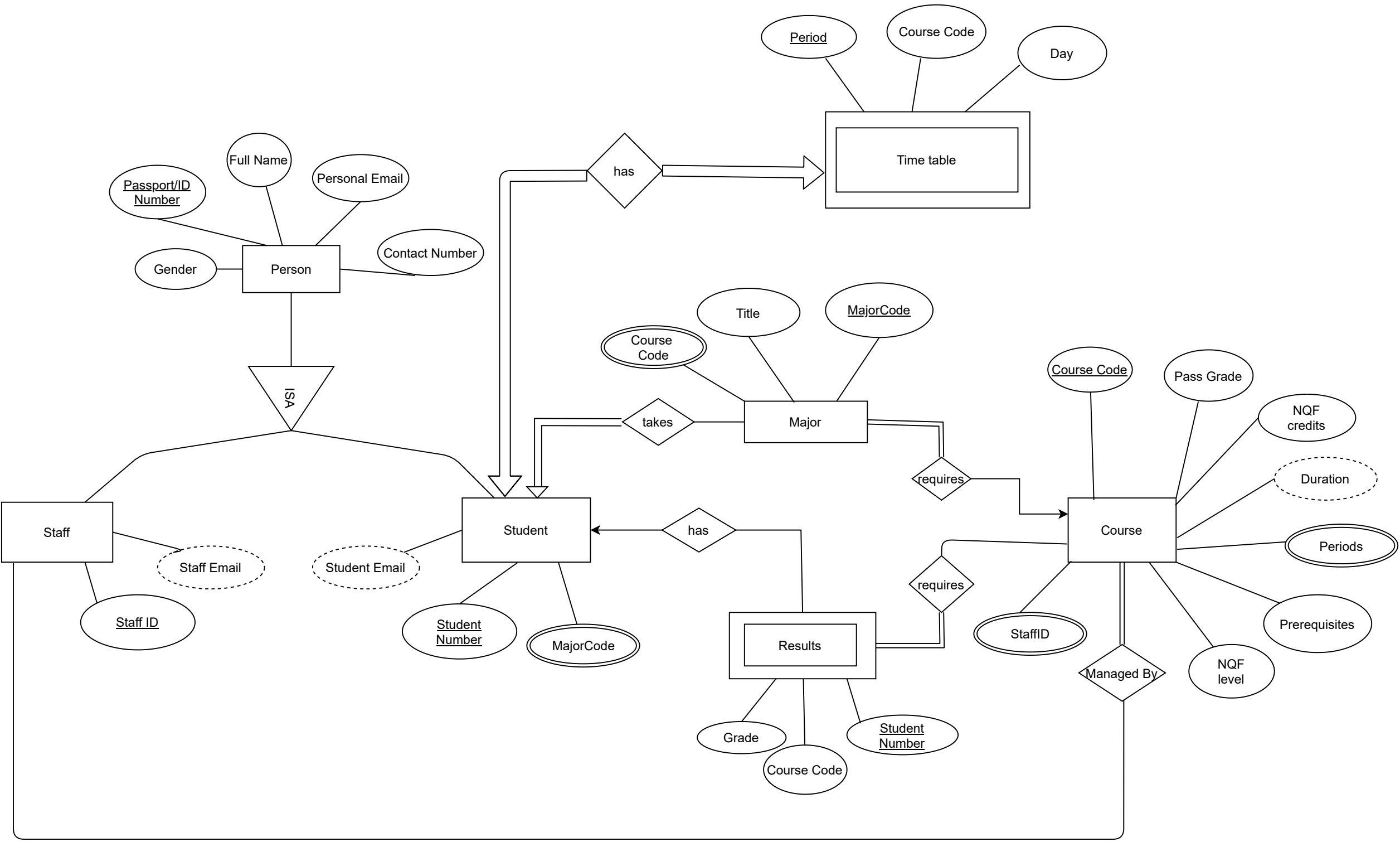
David White:

1. TREND. It is more concise and, being a diagram, it helps to effectively visualise the system as it is being designed. This makes designing the system more efficient and creates a clearer design.
2. TREND. It is more comprehensible and unambiguous, whereas a description in English would be lengthier and less understandable. Additionally, as with designing a system, interpreting a system in diagram form is very helpful in understanding the system.
3. Not confusing at all.
4. Ok but takes some getting used to.
5. Become(BCM) for CHG and expand(EXP)for EXT.
6. Ok but takes some getting used to.
7. As they are now.

Sibusiso Madlala:

1. TREND. It is unambiguous and more easily to read in a diagram
2. TREND. It might be difficult to understand a system that has been designed using english
3. fairly clear
4. not confusing at all
5. Transforms(TRANS) for CHG and promoted(PRM)
6. somewhat confusing
7. As they are now.

# Entity-Relationship model



# EXTENDED Entity-Relationship model

