1)

Suppose a table(A,B,C,D,E)

With dependencies

AB->C, D->E, C->B

   C->B is not satisfy BCNF property .

   R1(CB) and R2(ABDE) in BCNF

   Dependencies in R1 are {C->B } .

 In R2 are {C->B,D->E}

So, dependency is not preserved.

The main goal of BCNF design is to remove nonprime-to-prime attribute dependency.

2)

UnitID	StudenID	Date	TutorID	Topic	Room	Grade	Book	TutEmail
U1	St1	23.02.03	1	GMT	629	4.7	Deumlich	Tut1@fhbb.ch
U2	St1	18.11.02	3	GIn	631	5.1	Zehnder	Tut3@fhbb.ch
U1	St4	23.02.03	1	GMT	629	4.3	Deumlich	Tut1@fhbb.ch
U5	St2	05.05.03	3	Phf	632	4.9	Dummlers	Tut3@fhbb.ch
U4	St2	04.07.03	5	AVQ	621	5.0	SwissTopo	Tut5@fhbb.ch

UnitID	Date	Topic	Book
U1	23.02.03	GMT	Deumlich
U2	18.11.02	GIn	Zehnder
U5	05.05.03	Phf	Dummlers
U4	04.07.03	AVQ	SwissTopo

UnitID	Topic
U1	GMT
U2	GIn
U5	Phf
U4	AVQ

UnitID	Book
U1	Deumlich
U2	Zehnder
U5	Dummlers
U4	SwissTopo

UnitID	Date
U1	23.02.03
U2	18.11.02
U5	05.05.03
U4	04.07.03

UnitID	StudenID	TutorID	Grade	TutEmail
U1	St1	1	4.7	Tut1@fhbb.ch
U2	St1	3	5.1	Tut3@fhbb.ch
U1	St4	1	4.3	Tut1@fhbb.ch
U5	St2	3	4.9	Tut3@fhbb.ch
U4	St2	5	5.0	Tut5@fhbb.ch

UnitID	StudenID	TutorID	Grade
U1	St1	1	4.7
U2	St1	3	5.1
U1	St4	1	4.3
U5	St2	3	4.9
U4	St2	5	5.0

TutorID	TutEmail
1	Tut1@fhbb.ch
3	Tut3@fhbb.ch
5	Tut5@fhbb.ch

3)

ProjectName	ProjectManager	Position	Budget	TeamSize
Project1	Manager1	CTO	1 kk $	15
Project2	Manager2	CTO2	1.5 kk $	12

ProjectName	TeamSize
Project1	15
Project2	12

ProjectName	Budget
Project1	1 kk $
Project2	1.5 kk $

ProjectManager	Position
Manager1	CTO
Manager2	CTO2

4)

Group	Faculty	Specialty
G1	F1	S1
G2	F2	S2

Group	Specialty
G1	S1
G2	S2

Faculty	Specialty
F1	S1
F2	S2

5)

ProjectID	Department	Curator	TeamSize	ProjectGroupsNumber
P1	D1	E1	100	5
P2	D2	E2	120	6

Since

TeamSize->ProjectGroupsNumber

{ProjectID, Department}->TeamSize

Which is Transitive Dependency

So,

TeamSize	ProjectGroupsNumber
100	5
120	6

ProjectID	Department	Curator	TeamSize
P1	D1	E1	100
P2	D2	E2	120

6)

Main goals of relational database design:

1) Reducing data rebundacy
2) Avoiding anomalies(inserting , deleting and updating)
3) Excluding data inconsistency